

**ROLE OF LEACHED POTATO ON RENAL FUNCTION  
AMONG PATIENTS WITH CHRONIC RENAL  
FAILURE AT NALLASWAMY KIDNEY  
CENTRE, ERODE, TAMILNADU.**



*A DISSERTATION SUBMITTED TO THE TAMILNADU Dr.M.G.R  
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THE REQUIREMENT FOR THE DEGREE OF AWARD OF*

**MASTER OF SCIENCE IN NURSING**  
**MEDICAL SURGICAL NURSING** (*Critical Care Nursing*)

**BY**

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**CERTIFIED THAT THIS IS THE BONAFIDE WORK OF**

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN  
NURSING TO THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY,  
CHENNAI.

**EXAMINERS,**

1. ....

2. ....

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*“When thou passest through the waters, I will be with thee; and through the rivers, they shall not overflow thee: when thou walkest through the fire, thou shalt not be burned; neither shall the flame kindle upon thee”.*

**Isaiah 43:2**

*“For wisdom is better than rubies; and all things that may be desired are not compared to it”.*

**Proverbs 8:11**

*“I can do all things through Christ which strengtheneth me”.*

**Philippians 4:13**

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*“Honour thy father and thy mother: that thy days may be long upon the land which the lord thy God giveth thee”.*

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*“If you raise your children to feel that they can accomplish any goal or task they decide upon, you will have succeeded as a parent and you will have given your children the greatest of all blessings.”*

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**BY**  
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## CHAPTER-I

### INTRODUCTION

**“As a searcher for Truth I deem it necessary to find the perfect food for a man to keep body, mind and soul in a sound condition.”**

**-Gandhiji**

Depression and perception of negative thoughts are common among clients with chronic renal failure. Their minds are clouded with various thoughts in respective of self, family, finance and prognosis of illness. The chronic renal failure patients lead a high abnormal life. All chronic renal failure patients find themselves adjectively dependent on a procedure, medical facility, a group of medical personnel and are exposed to various stressors like dietary and time constraints, functional limitations, loss of employment, changes in self-perception, alterations in sexual function, general and perceived effects of illness, medications used to treat the illness, and fear of death, **(Kimmel PL, 2001)**

**The Kidney Disease Outcomes Quality Initiative (K/DOQI) of the National Kidney Foundation (NKF) (2002)** defines chronic kidney disease as either kidney damage or a decreased kidney glomerular filtration rate (GFR) of less than 60 mL/min/1.73 m<sup>2</sup> for 3 or more months.

In the United States at the end of 2005, over 345,000 individuals with ESRD were being treated for CKD. Of these more than 245,000 were dialysis patients, and more than 100,000 had a functioning kidney transplant. Over the past five years, the number of new patients with kidney failure has average about 80,000 annually. This number of patients with ESRD is expected to reach 660,000 by 2012. Each year about 70,000 people die from causes related to renal failure, **(Lewis, 2006)**.

Incidence of End-stage renal disease is likely to be higher in India than the developed country with glomerulonephritis being the most common cause, accounting for more than one-third of patients the crude and age adjusted incidence rates of end stage renal disease (ESRD) were 151 and 232 per million population, respectively, **(Sukhuja V, 2003)**

Renal units in India are offering treatment to 80-100 new patients with end-stage renal failure per million each year. End-stage renal failure population has exceeded 7, 00,000 by the turn of the century, **(Gulati P.D, 2007)**.

In a community based study from Delhi in Northern India, the prevalence of chronic kidney disease was reported to be 7852 per million populations; this report provides the most current nationally representative estimates of CKD. The findings indicate that CKD affected an estimated 16.8% of adults aged  $\geq 20$  years. A estimate of 14.5%. Persons with CKD have high rates of morbidity, mortality,

and health-care utilization (6,7). The findings in this report suggest that CKD is a growing health problem in India, **(Agarwal, 2005)**.

End-stage renal failure has many causes, including primary renal disease, systemic disease involving kidney, and inherited disease. These various etiologies can be classified in to six groups and they are diabetes mellitus, hypertension, glomerulonephritis, cystic disease, and urologic disease, **(Ralph .J, 2003)**.

Normally in the body, the kidney regulates the sodium and water balance and intravascular volume and plays the key role in potassium and acid base homeostasis. Renal failure results when the kidneys are unable to remove the body's metabolic wastes or perform their regulatory functions. The substances normally eliminated in the urine accumulate in the body fluids as a result of impaired renal excretion and lead to a disruption in endocrine and metabolic functions as well as fluid, electrolyte and acid base disturbances, **(Suzanne, 2005)**

As renal function progressively deteriorates, every body system is involved. Clinical signs are a result of retained substance including urea, creatinine, phenols, hormones and abnormal electrolyte and acid- base disturbances. Potential complications of chronic renal disease that concerns nurse and that necessitates collaborative care include Hyperkalemia, pericarditis, bone disease and hypertension. **(Brunner, 2004)**.

As the renal function deteriorates, it is associated with bio-psychosocial process that promotes or inhibits adaptive functioning. Patients with chronic life-threatening illness are often angry, depressed or anxious. The emotional response that may accompany chronic illness helps to improve the quality of life and adherence to prescribed regimen of treatment, **(Stuart, 2005)**.

The American National Kidney Foundation's Kidney Disease Outcomes Quality Initiative work group developed a classification system that separated the period from very early kidney disease to end stage kidney failure into five stages and their prevalence rate. Stage I- 3.1%, stage II- 4.1%, Stage III- 7.6%, stage IV- 0.5% and stage V- 0.5%, **(National Kidney Foundation, 2002)**.

End-stage renal disease can be treated by renal replacement therapies, such as hemodialysis, transplantation, and peritoneal dialysis. Hemodialysis is the therapy used most often. Among patients with end-stage renal disease, 66% in the United States and 46% to 98% in Europe receive hemodialysis. Although hemodialysis effectively contributes to long-term survival, morbidity and mortality of dialysis patients remains high, especially morbidity and mortality due to cardiovascular diseases.<sup>3-7</sup> Only 32% to 33% of patients on hemodialysis survive to the fifth year of treatment, whereas 70% of patients who have kidney transplants are alive after 5 years, **(Marshall J, 2007)**.

India currently has 820+ nephrologists, 710+ hemodialysis units with 2,500+ dialysis stations and 4,800+ patients on CAPD. There are 172+ transplant

centers, two-thirds of which are in South India and mostly privately run. Nearly 3,500 transplants are done annually, the total number of cadaver donors being approximately 700 till now. Thus, taken together, nearly 18,000–20,000 patients (10% of new ESRD cases) in India get renal replacement therapy. The government has initiated a process by which it is planning to establish stand-alone hemodialysis units in the country to increase the facilities at an affordable cost, and on the transplant side it had launched a National Organ Transplant Program to facilitate transplantation on a national scale, **(Karger S and Basel AG, 2009)**

If Serum Creatinine (Scr) level is too high, the toxins in human body cannot be excreted timely, which will easily cause various complications, thus threatening people's life. At that time, Renal Failure patients are badly in need of effective therapy to excrete the toxins in order to lighten the complications and maintain the normal sign of the body. While dialysis contains hemodialysis and peritoneal dialysis is an effective and timely method. Generally speaking, if glomerular filtration rate of patients is declining seriously and the rest renal function is only less than 10%, it indicates Renal Failure has developed into Creatinine Renal Failure---Uremia, the patient must carry on dialysis, **(Shijiazhuang, 2010)**

Dialysis is a process used to remove fluid and uremic waste products from the body when the kidneys are unable to do so. It may also be used in treating patients with intractable edema, Hyperkalemia, hypertension and uremia. Chronic

or maintenance dialysis is indicated in chronic renal failure known as the end-stage renal failure in instances like occurrence of uremic symptoms affecting all body systems, Hyperkalemia, fluid overload not responsive to fluid restriction and diuretics, and general lack of well-being, **(Linda Traxler, 2000)**

Patients with chronic renal failure, hemodialysis prevents death, although it does not cure renal disease and does not compensate for loss of kidney's endocrine or metabolic activities. Patients receiving hemodialysis must undergo treatment for their rest of their lives (usually three times a week for at least 3-4 hours per treatment), **(Ann Peach, 2003)**

Food provides energy and repairs the body itself. The food taken is broken down in the stomach the nutrients are picked up by the blood and supply nutrition to the cells. The cells take up the nutrients and put the waste product back in to the blood stream. When kidneys are normal, the wastes are removed from the blood. Now that kidneys stopped functioning, hemodialysis removes waste from the body. But between dialysis the waste can build up and can make sick and this can be reduced or avoided by maintaining good dietary pattern. A good meal pattern can improve dialysis and good health, **(Herselman, MG, 2009).**

Diet plays vital role in dialysis patients' rehabilitative care. A well-balanced diet is necessary for them to stay fit as their kidneys are no longer

functioning at its full capacity i.e. to get rid of the waste products and fluid from their blood, **(Michael J, 2005)**.

There are complex and individualized dietary rules which help to reduce the progression of kidney disease and decrease the likelihood of complication. The general dietary guidelines are protein restriction, sodium restriction, fluid restriction, potassium restriction, phosphorous restriction and carefully following the prescribed regimen, **(Pranay Kathuria, 2005)**.

Excessive potassium level in the blood can cause muscle weakness, abnormal heart rates and in extreme cases, heart failure. Since dialysis can only remove a fixed amount of potassium, it is crucial to control the amount accumulated through patients' dietary intake. It is important to avoid foods that are high in potassium and to take in moderation food that has low to moderate content. Healthy kidney can keep the right amount of potassium level in the blood to keep your heart beating in a steady pace. Potassium levels can rise between dialysis sessions and affect heartbeat. Eating too much potassium can be very dangerous to your heart. It may even cause death, **(Sandra Ketcham, 2007)**.

The mineral potassium is found in many foods, especially fruits and vegetables. Potassium affects how steadily your heart beats, so eating foods with too much of it can be very dangerous to your heart. To control potassium levels in



your blood, avoid foods like oranges, bananas, tomatoes, potatoes, and dried fruits, **(Kim Bayer, 2004)**

Potassium is a mineral that controls nerve and muscle function. One very important muscle — the heart — beats at a normal rhythm because of potassium. In addition, potassium is necessary for maintaining fluid and electrolyte balance and pH level. Healthy kidneys help keep potassium at a normal level. Potassium comes from the foods we eat, and healthy kidneys remove excess potassium in the urine to help maintain normal levels in the blood. However, because people with chronic kidney disease (CKD) or people on kidney dialysis do not have healthy kidneys, potassium may build up in their bodies. For this reason, people with CKD and those on hemodialysis may have to limit foods high in potassium or find ways to remove potassium from the foods they eat, **(Sara Colman, RD, 2007)**.

People with chronic kidney disease can keep their potassium at safe level by Leaching high potassium vegetables, if including them in your diet. Leaching removes some of the potassium. Instruction for leaching vegetables are given below by **(Davita, 2004)**

- Peel the vegetable, cut into small pieces and place in a very large pot of water.
- Rinse the vegetables.

- Fill the pot with water and let the vegetables soak for at least four hours at room temperature
- After soaking, rinse the vegetables with clean water.
- Cook vegetables as desired.
- Limit portion to one serving, usually 1/2 cup.

A medium-size 150 g (5.3 oz) potato with the skin provides 27 mg of vitamin C (45% of the Daily Value (DV)), 620 mg of potassium (18% of DV), 0.2 mg vitamin B<sub>6</sub> (10% of DV) and trace amounts of thiamin, riboflavin, folate, niacin, magnesium, phosphorus, iron, and zinc. The fiber content of a potato with skin (2 g) is equivalent to that of many whole grain breads, pastas, and cereals. In terms of nutrition, the potato is best known for its carbohydrate content (approximately 26 grams in a medium potato).

Potatoes are a valuable source of mineral nutrients that provide high levels of potassium. Individuals with compromised kidney function, however, must minimize their potassium intake. Consumption of potatoes may benefit healthy persons by adding potassium and other minerals to their diet, but potato consumption by persons with chronic renal failure may be harmful. The recommended potassium intake in kidney dialysis patients is 2 to 4 g/d. For these persons, leaching cut potatoes in water prior to cooking is advised as a way to reduce potassium content, **(Bethke, 2007)**.

## NEED FOR THE STUDY

The experience of dialysis can be very destructive for both the individual with the disease and that individual's family, resulting in a life that is greatly narrowed in scope with increased dependency on one's partner. The patient on dialysis is threatened with many potential losses and life-style changes including decreased financial status, fluid and food restrictions, changes in family roles and responsibilities, and decreased ability to fulfill long-range life goals, (**Gurklis & Menke, 2005**).

**Chronic kidney disease** (CKD), also known as **chronic renal disease**, involves progressive, irreversible destruction of nephrons in both the kidneys. Chronic kidney disease is a progressive loss in renal function over a period of months or years, (**Lewis, 2003**)

ESRD is a devastating medical, social and economic problem for patients and their families. The availability and quality of dialysis programmes largely depend on the prevailing economic conditions and social support, (**Collier, 2003**).

The prevalence of chronic renal disease is rising worldwide. The global patient population with an end stage renal disease continues to grow at the rate of 7 per cent per annum due to demographic transition, increase in disease leading to chronic renal disease and increased availability of diagnostic and therapeutic facilities, (**Shyam and Sreenivas , 2005**).

The incidence of ESRD has increased by almost 8% per year for the past five years. In the united states, more than 280,000 patients with chronic renal failure (65%) are receiving hemodialysis; more than 120,000 (28%) have functioning renal transplants, and more than 24,000 (7%) are receiving peritoneal dialysis, **(United States Renal Data System, 2004).**

According to national kidney foundation, approximately 80,000 people die from kidney disease in this country every year. In 2002 only 9% were free of co-morbid conditions. More than 65,000 patients with ESRD die annually, and 23% annual mortality rate reflects the degree to which ESRD affects mainly a severely ill geriatric population, **(White.L.et.al, 2005)**

Incidence of CKD has doubled in the last 15 years. In the USA, ~30 million people suffer from CKD. India's national CKD registry organized under the auspices of Indian Society of Nephrology and housed in Kidney Institute at Nadiad has given data from 45,885 subjects admitted to 166 kidney centers in India up to January 2010."It is noted that CKD, secondary to diabetes, heads the list at 31.2 per cent, **(Acharya, 2001).**

**Whorra.P.C. (2001)** conducted a research among 183 patients who were on seven years of experience with hemodialysis treatment for ESRD in Dehradun and found that the incidence and prevalence was more among male when

compared to females and majority of the patients (71%) were above the age of 40 years.

A community based study has been done to determine the prevalence of chronic renal failure in India. Using multi-stage cluster sampling a total of 4972 persons were contacted for the study. The individuals contacted responded to a detailed questionnaire, and had a physical examination, a dipstick urine test for albumin and sugar and a blood test for serum creatinine. A serum creatinine  $>1.8 \text{ mg\%}$  defined renal failure. A repeat test for serum creatinine was done after 8–12 weeks to confirm chronicity of renal failure. If it was  $>1.8 \text{ mg\%}$  after 3 months in the absence of reversible factors, CRF was diagnosed. The person found to have CRF was asked to attend a hospital renal clinic for further investigations and individualized management. Thus, the prevalence of CRF in that adult population was 0.785% or 7852/million, **(Suresh Chand Dash, 2005)**.

**According to the World Health Report 2002 and Global Burden of Disease (GBD) project**, diseases of the kidney and urinary tract contribute to the global burden of diseases, with approximately 850,000 deaths every year and 15,010,167 disability-adjusted life years.

In the rural population of Chennai from South India, the evidence of CKD short of renal failure was 0.7%, **(Maniet al, 2009)**.

The kidney help trust of Chennai has surveyed a population of 25,000 to identify the risk of renal failure by estimating glomerular filtration rate using MDRD formula. The prevalence of impaired renal function is 8.6 per thousand population, (**Muthu Krishnan, 2005**)

Nallaswamy Kidney Centre, a well known kidney centre in Erode, has a separate dialysis unit where patients with chronic renal failure in and around erode district are treated by means of dialysis. The statistical report reveals 15.2% cases are diagnosed each year and only 9.4% of the patients are only treated due o financial crisis. The mortality rate is 3.3% per year.

The world wide prevalence of etiology of chronic kidney disease was Diabetes mellitus – 34 %, hypertension – 29 %, glomerulonephritis – 14%, obstructive nephropathy – 9 %, pyelonephritis and interstitial kidney disease – 3%, polycystic kidney disease – 3 %, drug induced nephropathy – 1%, unknown (not detected) – 7%, (**Anonymous et al. 2002**).

**Zarzeclin M.et.al., (2004)** given the information on the main causes of ESRD were chronic glomerulonephritis (29%), diabetic nephropathy (27%), polycystic kidney disease (15%), interstitial (1%) and hypertensive nephropathy (9%).

An epidemiological, cross-sectional and multicenter study, in patients older than 65 years (n 625) and > 75 years (n 558) from 29 Spanish medical institutions was to perform an epidemiological analysis It included demographic information, as well as data regarding chronic renal failure, functional and psychological

abilities . The study analyzed data from 1,183 patients (678 female), mean age  $75,4 \pm 5,5$  years; mean duration of dialysis  $4,3 \pm 5,1$  years . The most frequent etiologies were diabetic nephropathy (21,2%) and vascular renal disease (20,9%). The main co-morbidities were high blood pressure (75,6%), Diabetes Mellitus (32,9%) and vascular (29,0%) and osteoarticular (27,3%) diseases. Around 75% of elderly patients on hemodialysis fulfill age-suitable daily living activities and display adequate dialysis quality parameters, **(Francisco. A.L.L.de, 2008)**.

Statistics of the South African Dialysis and Transplant Registry (SADTR), conducted a six-year study of 3632 patients with ESRD, based on SADTR statistics, hypertension was reported to be the cause of ESRD in 4.3% of whites, 34.6% of blacks, 20.9% mixed race group and 13.8% of Indians. In a ten-year study of 368 patients with chronic renal failure in Nigeria, the etiology of renal failure was undetermined in 62%. Of the remaining patients whose etiology was ascertained, hypertension accounted for 61%, diabetes mellitus for 11% and chronic glomerulonephritis for 5.9%. Patients with CRF constituted 10% of all medical admissions in this center. Chronic glomerulonephritis and hypertension are principal causes of CRF in tropical Africa and East Africa, together with diabetes mellitus and obstructive uropathy, **(Kidney International, 2003)**.

The kidneys have many functional roles, including fluid and electrolyte balance, waste removal, acid-base balance, bone health, and stimulation of red blood cell production. CKD can be associated with fluid overload, sodium and potassium imbalances, bone and mineral disorders, anemia, and reduced quality of

life. Additionally, adults with CKD typically have other chronic diseases, such as diabetes, hypertension, and other cardiovascular diseases, (**Christa Nolte, RN, 2006**).

Prior to early 1960's patient who developed end-stage renal disease faced an inevitable death within days to weeks with few expectations. The indication of hemodialysis and peritoneal dialysis has enabled these patients to survive many for years, resulting in a large population of patients with end-stage renal disease replacement therapy, (**John.T,2000**).

**Zuo wang (2006)**, reported the current status of HD in Beijing. Data collections forms were distributed to all HD centers in Beijing, and data from 2003 and 2004 were collected for analysis of incidence, prevalence, causes and mortality of end-stage renal disease treated by HD. The city has 122 HD centres. At the end of 2003 (December 31), 3,435 resident patients were on HD, the point prevalence then was 235.9 per million population (pmp). In 2004, 4,110 new cases of ESRD were diagnosed, of which 2,587 cases were Beijing residents, resulting in an annual incidence of HD treatment of 173.3 pmp. At the end of 2004, 4,014 resident patients were on HD, and the point prevalence increased to 268.9 pmp. The result shows that the prevalence and incidence of HD are increasing. Thus, for better prevention of ESRD, efforts should be made to clarify the reason for the increase. Also, the quality of health care provided needs to be improved for better quality of life for patients on HD.



**Man-ching law (2004)**, performed a single-center prospective observational study among continuous ambulatory peritoneal dialysis patient to identify the impact of dialysis adequacy on patient outcome among Caucasian patients in china. Multivariate analysis showed that the duration of dialysis, diabetes, %LBM, index of dialysis adequacy ( $Kt/V$  or  $C_{Cr}$ ), residual GFR, and requirement of a helper for CAPD exchanges were independent factors of patient survival; serum albumin, adequacy index ( $Kt/V$  or  $C_{Cr}$ ), and requirement of a helper were independent factors of technique survival. Duration of dialysis, body weight, and requirement of helper, cardiovascular disease, HBsAg carrier, serum albumin, and  $C_{Cr}$  had independent effects on hospitalization. Our results show that dialysis adequacy has significant impact on outcome of Asian CAPD patients.

**Urth M, et.al, (2004)**, conducted a study on health related quality of life among hemodialysis patients in USA, in which revealed that despite technical progress in therapy, hemodialysis patients continue to report health-related quality of life substantially lower than that of the general population while African-Americans with end-stage renal disease survive longer than the members of other races. Concluded that ESRD is the only chronic illness for which African-Americans report significantly better psychological well-being and a lower burden of disease than non-African – Americans. After adjustments there were no racial differences in score on the social support and dialysis staff encouragement or patient satisfaction.

**Sadler .J.H (2003)**, said that health promotion is the desired objective of dialysis-treatment. Achieving the highest level of functioning not only improves the life of the patient, but also rewards the staff through the positive feedback that helps improvement in procedures. Fundamental to achieving health is adequate dialysis, control of anemia, good nutrition and attention to co-morbid conditions.

To strive towards being healthy and happy dialysis patients, they would need to, eat the right kind and amount of food on a daily basis. To achieve good dialysis outcome, dialysis patients need to closely and careful monitor their diet so as to help control the waste products and fluids accumulated between dialysis treatments. It is essential for dialysis patients to have the right amount of protein, calories, fluids, vitamins and minerals each day, **(Burke. K, 2004)**

A Healthy Diet for a dialysis patient is, adequate in protein, adequate in calories, low to moderate in potassium, low in sodium low in phosphorus, controlled in fluids, **(Aguilera J, 2008)**.

**Oka. M. and Chaboyer. W (2001)**, conducted a study on “dietary behaviors and sources of support in hemodialysis patients” in Japan, in which he found that individuals with CRF generally have strict dietary guidelines and identified support from family members and nurses were significantly related to dietary behaviors. Nurses working with dialysis patients should remember to use their influence positively to support their patient and bear in mind that long-term

dialysis patients, especially those who are young and unmarried may benefit from ongoing nursing support and encouragement.

**Nand .N, et.al, (2003)**, conducted a study on “effect of dietary management of CRF patients” in Haryana, India, the effect of low protein 10.6 gm/Kg/day, low potassium (2-4mg/kg/day) diet with calcium (600mg/day) supplementation on renal and parathyroid functions in patients with CRF. There were symptomatic improvement in 88% patients, blood urea, creatinine decreased significantly, GFR improved. So dietary management should be strictly enforced in CRF patient in the early course of disease.

**Lee .S.H. (2002)**, conducted a cross-sectional study, examined dietary and fluid compliance behaviors in Chinese hemodialysis patients in Hong Kong and information was obtained about their knowledge of fluid and dietary restrictions related to dialysis, health beliefs, personal and medical characteristics, and self-reported compliance. In addition serum levels of potassium and phosphate and intra-dialytic weight gain were retrieved from the medical records, dietary and fluid compliance was observed in only 35.5% and 40.3% of the patients respectively. Patients with more hours on hemodialysis per week found to be more fluid non-compliant. Working patients and those whose diet was prepared by someone else in the family were also more likely to be non-compliant. Health professional should be aware of the factors behind non-compliance in HD patients and assist them in making life style changes.

Elevated potassium is of special concern for patients with chronic kidney disease. Patients with kidney disease are advised to moderate their intake of potassium through careful selection of foods and by preparing foods in ways that minimize potassium consumption, (**Krishnan, 2006**).

**Ren Fail (2010)**, conducted a study was to estimate the prevalence of hyperkalemia among Egyptian hemodialysis patients. 400 ESRD patients on maintenance hemodialysis were enrolled in the study. For all patients, history and clinical examinations and serum potassium level was measured three times--pre- and post-1st session and pre-next session--at two successive sessions of hemodialysis. The results of this study showed that the prevalence of hyperkalemia was 41.2%, 6.5%, and 66.9% of pre- and post-dialysis and before the next session of dialysis, respectively. Hyperkalemia significantly correlates with potassium-rich diets, non-compliant patients, two sessions of hemodialysis per week, and constipation in ESRD patients during the study periods. Hyperkalemia is a frequent problem in patients with end stage renal disease in Egypt.

**Stephen L. Seliger (2009)**, conducted a retrospective analysis of a national cohort comprised 2 103 422 records from 245 808 patients with at least 1 hospitalization and at least 1 inpatient or outpatient serum potassium record . Chronic kidney disease and treatment with angiotensin-converting enzyme inhibitors and/or angiotensin II receptor blockers (blockers of the

reninangiotensin- aldosterone system [RAAS]) were the key predictors of hyperkalemia. Of the 66 259 hyperkalemic events (3.2% of records), more occurred as inpatient events (n=34 937 [52.7%]) than as outpatient events (n=31 322 [47.3%]). The adjusted rate of hyperkalemia was higher in patients with CKD than in those without CKD among individuals treated with RAAS blockers (7.67 vs 2.30 per 100 patient-months;  $P_{.001}$ ) and those without RAAS blocker treatment (8.22 vs 1.77 per 100 patient months;  $P_{.001}$ ). The risk of hyperkalemia is increased with CKD, and its occurrence increases the odds of mortality within 1 day of the event. These findings underscore the importance of this metabolic disturbance as a threat to patient safety in CKD.

Potatoes are a valuable source of mineral nutrients that provide high levels of potassium. Individuals with compromised kidney function, however, must minimize their potassium intake. A new study in the Journal of Food Science provided certain potato preparation guidelines for kidney dialysis patients by exploring the effects of leaching and boiling on levels of potassium and other minerals in potatoes and found that boiling cubed or shredded samples reduced potassium levels by 50 percent and 75 percent, respectively, (**Jasline, 2008**)

**Agricultural Research Service Scientist Jansky (2008)** analyzed 1/2-inch cubed potato pieces (that's very small) and grated potatoes soaked in the refrigerator for 20 hours at 42° F and then boiled. The results showed that boiling reduced the potassium just as effectively as soaking then boiling. The raw potato

cubes that were not leached contained 400 milligrams of potassium. However, after boiling for 10 minutes in a large volume of water, the boiled cubes were reduced to 200 milligrams of potassium, and the boiled grated potatoes were reduced to 100 milligrams of potassium. The result of this could be a good cooking strategy for potato fans hoping to reduce potassium intake, such as dialysis patients.

**Madison (2007)**, has undertaken a study to determine the effects of leaching and boiling on levels of potassium and other minerals in potato tubers. Leaching alone did not significantly reduce levels of potassium or other minerals in tubers. Boiling tuber cubes and shredded tubers decreased potassium levels by 50% and 75%, respectively. In addition, mineral levels in tubers of 6 North American potato cultivars are reported. Significant differences in mineral levels were detected among cultivars, but they were too small to be nutritionally important. Individuals with compromised kidney function wishing to maximize the mineral nutrition benefits of consuming potatoes should boil them whole or bake, roast, or microwave them. Those who must reduce potassium uptake should boil small pieces before consuming them.

**Shelley Paul (2008)**, of the United States Department of Agriculture – University of Wisconsin-Madison Department of Horticulture, utilized samples of potatoes that had been shredded as well as potatoes that had been diced into 1 cm cubes. The samples were then leached or boiled, two treatments that are most

likely to have an impact on the mineral content of a consumed product. The mineral content of the potatoes was drastically reduced by either cubing or shredding them and then boiling. Boiling shredded potatoes reduced levels of potassium, zinc, magnesium by 50 percent. Boiled potato cubes lost 35 percent of their total magnesium and zinc. Leaching, which refers to soaking food in water before cooking, had little effect on the mineral levels of the samples. This exist little benefit for renal failure patients trying to reduce potassium consumption by leaching potatoes. Those with compromised kidney function can decrease their mineral intake while still taking advantage of the other nutritional qualities of potatoes by boiling them, thinly sliced. “Our study offers information about the nutritional quality of potatoes and the effects of cooking on the contents of mineral nutrients,” the authors conclude. “It will likely result in changes in recommendations by medical staff working with patients who have compromised kidney function.”

Potato is restricted in dietary regimen for patients with chronic renal failure, but through the process of leaching, potato can be included in their dietary pattern. The researcher felt that it is the responsibility of nursing staff to educate the leaching process to maintain the progression of renal function.

## **STATEMENT OF PROBLEM**

**"ROLE OF LEACHED POTATO ON RENAL FUNCTION AMONG PATIENTS WITH CHRONIC RENAL FAILURE AT NALLASWAMY KIDNEY CENTER, ERODE".**

## **OBJECTIVES**

- 1) To assess the level of renal function among patients with chronic renal failure in experimental and control group before and after leached potato
- 2) To determine the changes in renal function among patients with chronic renal failure in experimental and control group after leached potato.
- 3) To find out the association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.

## **OPERATIONAL DEFINITIONS**

### **Role**

Role refers to changes in renal function among patients with chronic renal failure as determined by significant difference between posttest scores of experimental and control group.



**Leached potato**

Leaching is a process of removing potassium content from the potato through series of steps and they are as follows:

Step 1: Wash 100gm of potato in the tap water

Step 2: Chop the potato into small pieces

Step 3: Soak the chopped potato in tap water for about one hour.

Step 4: Drain the water

Step 5: Boil the chopped potato in fresh water for 10 minutes.

Step 6: Drain the water

Step 7: Again re-boil the chopped potato in fresh water for 10 minutes.

Step 8: Drain the water.

Step 9: Repeat step 7 and step 8.

Step 10: Now the leached potato is used to prepare the dish.

This leached potato is advised to take for six days in a week.

This preparation is explained to the patient and care givers through video demonstration.

100mg of potato contains 420mg of potassium. Soaking one hour prior to cooking reduces 66mg of potassium. The amount of potassium lost after boiling is 51mg.

### **Renal function**

This refers to assessment of urinary output in 24 hrs, systolic and diastolic blood pressure, weight loss in kg, serum potassium, serum creatinine, and edema which is measured by using renal function parameter assessment scale.

### **Chronic renal failure patients**

It refers to patients who are diagnosed with chronic renal failure and are undergoing hemodialysis for thrice a week.

### **HYPOTHESES**

**H<sub>1</sub>** : There is significant level of renal function among patients with chronic renal failure in experimental and control group before and after Leached Potato.

**H<sub>2</sub>** : There is compromised level of renal function among patients with chronic renal failure patients in experimental and control group before and after Leached Potato.

**H<sub>3</sub>** : There is significant association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.

## **DELIMITATIONS**

The study was delimited to,

- Assess the role of leached potato.
- Identify changes in renal function
- Patients with chronic renal failure.
- Nallaswamy Kidney Centre, Erode.

## **CONCEPTUAL FRAME WORK**

### **Orlando's deliberate nursing process model**

A conceptual frame work refers to a frame work of prepositions for conducting research.

Conceptual frame work provides clear description of variables suggesting ways or method to conduct the study and guiding the interpretation, evaluation and integration of study findings, **(Polit and Hungler, 2003)**

**Wood and Helper (1994)**, states that, “when conducting research a theoretical frame work serves as a guide of map to systematically identify a logical, precisely defined relationship between the variables”.

**Orlando’s deliberate nursing process model** was selected for this present study. In this theory the nurse reacts to patient’s behavior by ascertaining both the meaning of the distress and what would alleviate the distress.

**Orlando’s deliberate nursing process model** consists of three components namely,

- ✧ Patient behavior
- ✧ Nurse reaction
- ✧ Nurse’s action.

### **Patient behavior**

According to theory, patient behavior means, patient feels helpless and person’s behavior reflects his feelings. It can be verbal (expressed by language such as complaints, requests, demands or refusals). Non-verbal (manifested physiologically such as heart rate, edema or motor activity or vocally such as crying).

In this theory patient’s verbal behavior is expressed through complaints of a client and non-verbal behavior is expressed through pretest about the renal function through renal function parameter assessment scale

## Nurse reaction

Nurse's reaction is comprised of three sequential parts:

- **Perception**: the nurse perceives the behavior through any of her senses.
- **Thought**: the perception leads to automatic thought.
- **Feeling**: the thought produces an automatic feeling.

In this present study,

- Nurse's perception is coming to a conclusion about the pretest i.e., impaired renal function.
- Nurse's thought is modify the dietary pattern
- Nurse's feeling is to include leached potato in the diet without causing any adverse effect.

## Nurse's action

According to the theory nurse activity can be **automatic** (decided on for reason other than the patient's immediate need) or **deliberative** (resulting from correctly identifying patient's need through validation of an interpretation made from the patient's behavior).

In this present study nurse's deliberative action is to educate and implement leaching process of potato, with the help of video demonstration.

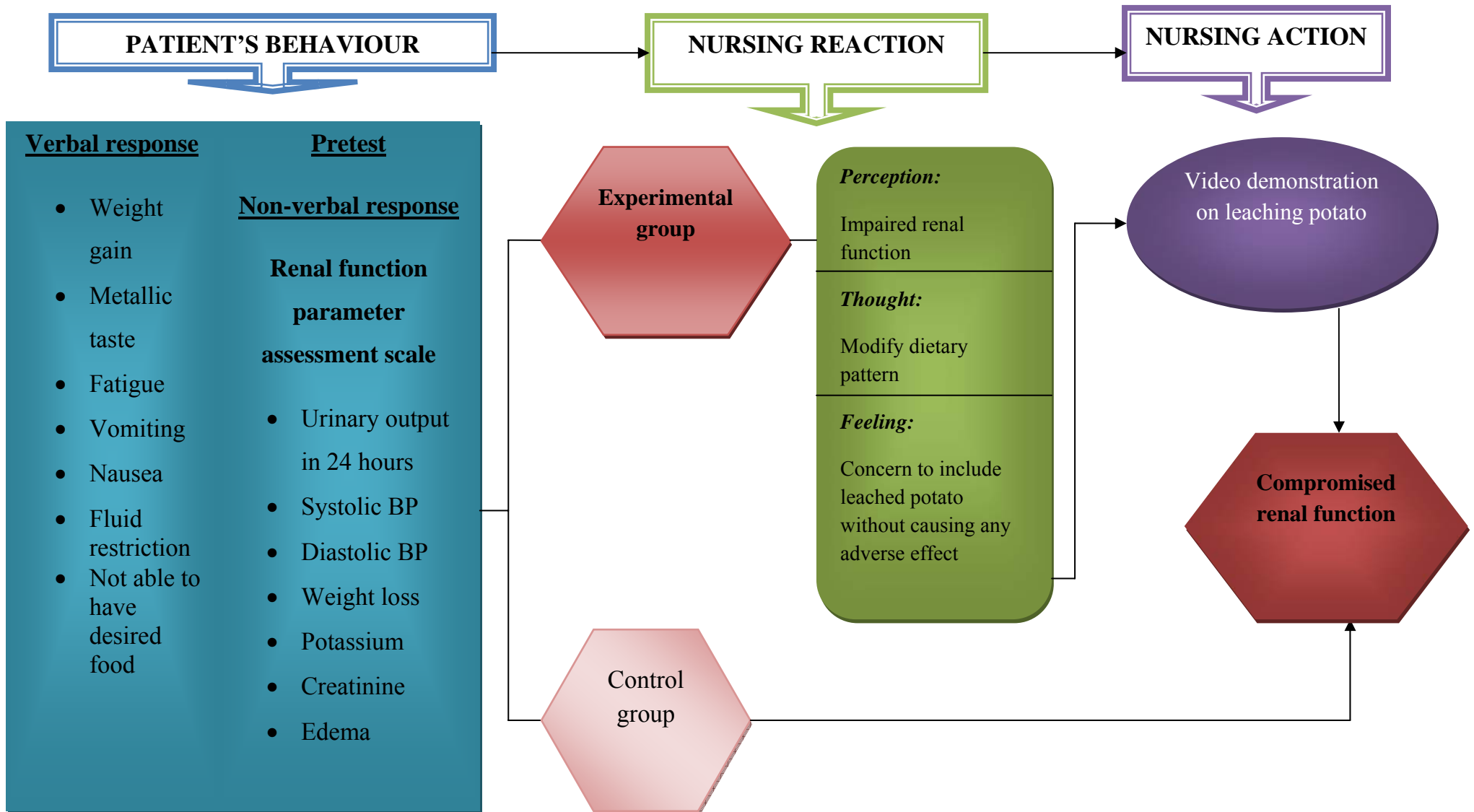


Fig 1.1 conceptual framework on Orlando's Deliberate Nursing Process Model

## CHAPTER II

### REVIEW OF LITERATURE

The review of literature is a broad, comprehensive, in depth, systematic and critical review of scholarly publication, unpublished scholarly print materials audiovisual material and personal communication.

A literature review is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection, critical analysis and written description of existing information on a topic, **(Polit and Hungler, 1999)**.

The review of literature in this study is organized under following headings;

- I. Studies related to renal function
- II. Studies related to leached potato
- III. Studies related to dietary management other than leached potato among patients with chronic renal failure.
- IV. Studies related to leached potato on renal function among patients with chronic renal failure.

## I. STUDIES RELATED TO LEACHED POTATO

**Jansky (2008)**, carried out Two trials with potato tubers at the Univ. of Wisconsin Lelah Starks Potato Research Station near Rhinelander, Wis., U.S.A. In the 1st trial, The leaching treatment consisted of soaking each sample in 300 mL distilled water at 5.6 °C for 20 h. The water was then decanted off and the sample was lyophilized prior to mineral analysis. The leaching and boiling treatment consisted of leaching, decanting the water off and replacing it with 300 mL fresh distilled water, bringing the water to a boil, boiling for 10 min, decanting the water off, and then lyophilizing the sample. The control consisted of lyophilized raw tuber samples. One freeze-dried sample of each replication of each treatment was ground into a powder using a mortar and pestle. For each sample, 500 mg of dried tuber tissue and 5 mL of concentrated nitric acid were added to a 50-mL Folin digestion tube. The mixture was heated to 120 to 130 °C for 14 to 16 h and then treated with hydrogen peroxide. After digestion, the sample was diluted to 50 mL. This solution was analyzed for minerals by inductively coupled plasma optical emission spectrometry. The Shredded tubers ( $2 \times 5 \text{ mm} \times \text{tuber length}$ ) were evaluated along with cubes. An additional processing treatment, boiling, was also added. The boiling treatment consisted of placing a freshly prepared sample in 300 mL distilled water, bringing the water to a boil, and then boiling for 10 min. The water was then decanted off and the sample was lyophilized. Statistical analyses included analysis of variance (ANOVA) using the general linear model in SAS and means separation using a protected least significant difference test at  $P = 0.05$ .



The amount of K remaining in the potato samples was strongly dependent on the preparation method. Leaching of cubed samples had little effect on K content, and the average amount of K remaining was 96% and 100% of control values in trials 1 and 2 respectively. Shredded samples retained less of their K after leaching, but K amounts after overnight leaching were still 83% to 98% of control values.

**Bethke (2008)**, analyzed 1/2-inch cubed potato pieces (that's very small) and grated potatoes soaked in the refrigerator for 20 hours at 42° F and then boiled. The results showed that boiling reduced the potassium just as effectively as soaking then boiling. The raw potato cubes that were not leached contained 400 milligrams of potassium. However, after boiling for 10 minutes in a large volume of water, the boiled cubes were reduced to 200 milligrams of potassium, and the boiled grated potatoes were reduced to 100 milligrams of potassium.

**Burrowes (2008)**, compared potato varieties and potassium removal without soaking. Instead 1/8" potato slices were boiled until tender. One batch was boiled once as with normal cooking (NC). The second batch was brought to a boil, drained, and then boiled until tender, called double cooking (DC). Results revealed that potassium removal was effective although the amount varies with potato variety. Idaho, red, purple, white and Russian fingerling potatoes had potassium content ranging from 162-194 mg/100 g after double cooking. Yukon gold potatoes were higher, 235 mg/100 g.

**McVeigh (1990)**, analyzed cubed, grated and French-fry-cut potatoes soaked in the refrigerator in cold water (40° F) for four hours. Ten times the amount of water to potatoes was used. In this study, potassium in raw potatoes was reduced from 340 milligrams to 290 milligrams after four hours of leaching. For the grated potatoes soaked in the refrigerator, potassium was 150 milligrams after four hours. The French-fry-cut potatoes were 340 milligrams after four hours of soaking.

**Louis (1970)**, analyzed dehydrated and raw potato slices and soaked in water at room temperature for 30 minutes. The volume of water was 10 times more than potatoes. Dehydrated potato slices were rinsed and boiled for 5-10 minutes. This method of soaking and boiling reduced potassium from 400 milligrams per every 100 grams of potatoes to 86 milligrams for dehydrated slices of potato. The results confirmed that maximum surface exposure with a large amount of water at room temperature or higher effectively removed potassium.

**Tsaltas (1969)**, sliced potato into 1/8th-inch slices or diced into small dice-size cubes and soaked in heated water (122 to 140° F) for two hours. The water volume was 10 times more water than potatoes. Next, the potatoes were rinsed and boiled in five times more water for five minutes. This method of soaking and then boiling the potatoes reduced potassium from 400 milligrams per every 100 grams (equal to 2/3 cup) of potatoes to 211 milligrams for cubes and 90 milligrams for thinly sliced potato

## II. STUDIES RELATED TO RENAL FUNCTION

**Jerry Avorn MD (2005)**, done a study to quantify specific clinical predictors of reduction in renal function in patients with CHF who are prescribed angiotensin-converting enzyme inhibitor therapy. Randomized clinical trial used to analyze data from the Studies of Left Ventricular Dysfunction (SOLVD), There were 3379 patients randomly assigned to enalapril with a median follow-up of 974 days and 3379 patients randomly assigned to placebo with a mean follow-up of 967 days We used time-to-event analysis to identify potential predictors of decrease in renal function including age, baseline ejection fraction, baseline creatinine, low systolic blood pressure (<100 mm Hg), history of hypertension, diabetes, and use of antiplatelet, diuretic, and  $\beta$ -blocker therapy. Patients randomly assigned to enalapril had a 33% greater likelihood of decreased renal function than controls ( $P = .003$ ). By multivariate analysis, in both the placebo and enalapril groups older age, diuretic therapy, and diabetes were associated with decreased renal function, whereas  $\beta$ -blocker therapy and higher ejection fraction were renoprotective. Older age was associated with a greater risk of developing decreased renal function in both groups, but significantly more so in the enalapril group (enalapril: risk ratio [RR] 1.42 per 10 years, 95% placebo: RR 1.18, 95%). Diuretic therapy was likewise associated with a greater risk of decreased renal function in the enalapril group (RR 1.89, 95% CI 1.70-2.08) than in the placebo group (RR 1.35, 95% CI 1.09-1.66).. A lower risk of renal impairment was seen in

both groups with  $\beta$ -blocker therapy (RR 0.70, 95% CI 0.57-0.85) and higher baseline ejection fraction (RR 0.93 per 5% increment, 95% CI 0.91-0.96). Enalapril use caused a 33% increase in the risk of decreased renal function in patients with CHF. Diuretic use and advanced age increased this risk. Diabetes was associated with an increased risk of renal impairment in all patients with CHF, but this risk was reduced in the enalapril group compared with the placebo group.  $\beta$ -Blocker therapy and higher ejection fraction were renoprotective in all patients regardless of therapy.

**Andrew D, et.al, (2003)**, done a cohort study to measure GFR (*e.g.*, iothalamate clearance), serum creatinine (SCr)-based GFR estimates, or creatinine clearance as a determination for renal dysfunction among chronic renal disease. 234 patients with autosomal dominant polycystic kidney disease and baseline creatinine clearance  $>70$  ml/min were followed annually for four visits. Iothalamate clearance, SCr, and creatinine clearance were obtained at each visit. Estimated GFR (eGFR) was determined with the Modification of Diet in Renal Disease (MDRD) and Cockcroft-Gault equations. Renal function slopes had a mean residual SD of 10.7% by iothalamate clearance, 8.2% by MDRD equation, 7.7% by Cockcroft-Gault equation, and 14.8% by creatinine clearance. By each method, a decline in renal function (lowest quintile slope) was compared among baseline predictors. Hypertension was associated with a decline in iothalamate clearance (odds ratio [OR] 5.8; 95% confidence interval [CI] 2.3 to 14), eGFR

(OR [MDRD] 2.0 [95% CI 1.0 to 4.2] or OR [Cockcroft-Gault] 1.9 [95% CI 0.9 to 3.9]), and creatinine clearance (OR 2.0; 95% CI 1.0 to 4.2). Each doubling of kidney volume at baseline was associated with a decline in iothalamate clearance (OR 2.4; 95% CI 1.5 to 3.7), eGFR (OR 1.7 [95% CI 1.1 to 2.6] or 2.1 [95% CI 1.4 to 3.3]), and creatinine clearance (OR 1.7; 95% CI 1.1 to 2.5). Predictor associations were strongest with measured GFR. Misclassification from changes in non-GFR factors (*e.g.*, creatinine production, tubular secretion) conservatively biased associations with eGFR. Misclassification from method imprecision attenuated associations with creatinine clearance.

**Hampton, MD (2003)**, studied whether renal function is a predictor for mortality in advanced CHF, and we assessed its relative contribution compared with other established risk factors. In addition, we studied the relation between renal function and neurohormonal activation. The study population consisted of 1906 patients with CHF who were enrolled in a recent survival trial (Second Prospective Randomized study of Ibopamine on Mortality and Efficacy). In a subgroup of 372 patients, plasma neurohormones were determined. The baseline glomerular filtration rate ( $GFR_c$ ) was calculated using the Cockcroft Gault equation.  $GFR_c$  was the most powerful predictor of mortality; it was followed by New York Heart Association functional class and the use of angiotensin-converting enzyme inhibitors. Patients in the lowest quartile of  $GFR_c$  values (<44 mL/min) had almost 3 times the risk of mortality (relative risk, 2.85;  $P<0.001$ ) of patients in the highest quartile (>76 mL/min). Impaired left ventricular ejection

fraction (LVEF) was only modestly predictive ( $P=0.053$ ).  $GFR_c$  was inversely related with N-terminal atrial natriuretic peptide (ANP;  $r=-0.53$ ) and, to a lesser extent, with ANP itself ( $r=-0.35$ ; both  $P<0.001$ ). Impaired renal function ( $GFR_c$ ) is a stronger predictor of mortality than impaired cardiac function (LVEF and New York Heart Association class) in advanced CHF, and it is associated with increased levels of N-terminal ANP. Moreover, impaired renal function was not related to LVEF, which suggests that factors other than reduced cardiac output are causally involved.

**Sara-Joan (2003)**, studied the relation between body weight and fat distribution and microalbuminuria and elevated or diminished filtration in 7,676 subjects without diabetes. The total population was divided into six groups according to body weight (overweight is defined as body mass index [BMI]  $> 25$  and  $\leq 30$  kg/m<sup>2</sup>; obesity, as BMI  $> 30$  kg/m<sup>2</sup>) and fat distribution. In logistic regression analysis, obese subjects with central fat distribution had a greater risk for microalbuminuria (relative risk, 1.7; 95% confidence interval, 1.19 to 2.35). Obese subjects with either peripheral or central fat distribution had a greater risk for elevated filtration (relative risk, 3.2; 95% confidence interval, 1.19 to 8.47; relative risk, 2.6; 95% confidence interval, 1.59 to 4.28, respectively). Furthermore, subjects with central fat distribution, either lean, overweight, or obese, had a greater risk for diminished filtration (relative risk, 1.9; 95% confidence interval, 1.19 to 3.12; relative risk, 2.0; 95% confidence interval, 1.19 to 3.19; and relative risk, 2.7; 95% confidence interval, 1.46 to 4.85, respectively).

Finally, by dividing waist-hip ratio (WHR) into quartiles, greater WHR was associated with a greater risk for diminished filtration, even when corrected for BMI. In conclusion not only overweight and obese subjects, but also lean subjects with central fat distribution are at risk for diminished Renal Function, Neurohormonal Activation, and Survival in Patients with Chronic Heart Failure.

**Edward Franek (2002)**, performed a comprehensive study to compare several aspects of renal function in four groups: (i) young healthy normotensive subjects (N = 24; 13 males; mean age  $26 \pm 3$  years); (ii) elderly healthy normotensive subjects (elderly NT; N = 29; 13 males;  $68 \pm 7$  years); (iii) elderly treated and untreated hypertensive patients (elderly HT; N = 25; 13 males;  $70 \pm 6$  years); and (iv) elderly patients with compensated mild to moderate heart failure (elderly HF; N = 14; 6 males;  $69 \pm 6$  years). Compared to young subjects mean GFR ( $C_{In}$ ) and ERPF ( $C_{PAH}$ ) were significantly lower in the elderly, despite similar mean plasma creatinine levels (young,  $121 \pm 11$ ,  $650 \pm 85$  ml/min/1.73 m<sup>2</sup>; elderly NT,  $103 \pm 11$ ,  $486 \pm 102$ ; elderly HT,  $103 \pm 13$ ,  $427 \pm 55$ ; elderly HF,  $92 \pm 14$ ,  $377 \pm 103$ ). Nevertheless, GFR was within the normal range in the majority of elderly NT and HT, but not in elderly HF. In the elderly, mean PTH concentration and urinary excretion of pyridoline cross-links were significantly higher and mean 25-(OH)D<sub>3</sub>, calcitriol and phosphate concentrations significantly lower; the correlation between PTH and GFR was significant ( $r = -0.432$ ,  $P < 0.001$ ). The results document that the decrease in renal hemodynamics with senescence is less

marked than suggested by some studies using less stringent methodology and inclusion criteria. Comorbid conditions confound renal function in the elderly. Age-associated changes in renal hemodynamics are accompanied by significant alterations of renal hormones and of renal sodium handling.

**Steven J. Hoorntje (2002)**, conducted a study to find relationship between peritoneal transport characteristics as well as residual renal function outcome in patients treated with continuous ambulatory peritoneal dialysis (CAPD). In the present study, the relationship between fluid state [extracellular water (ECW) (sodium bromide); total body water (TBW) (deuterium oxide)] with peritoneal transport characteristics (2.27% glucose dialysate/plasma creatinine [D/P (creat)] ratio), residual renal function (residual glomerular filtration rate [rGFR] by urine collection) and C-reactive protein (CRP) was assessed in 37 CAPD patients in a cross-sectional and longitudinal design, with 25 patients completing the study. In the cross-sectional part ECW, corrected for height (ECW:height), was inversely related to rGFR (  $r=-0.40$ ,  $P=0.016$ ), whereas during the longitudinal part, D/P[creat] was related to the change in ECW ( $r=0.40$ ,  $P$ Neither D/P[creat] nor rGFR were related to CRP, whereas a significant relationship was observed between ECW:height and CRP (  $=0.05$ ).  $r=0.58$ ,  $P=0.0001$ ). Patients were dichotomized according to rGFR ( $<2$  or  $>2$  ml/min). Despite a higher daily peritoneal glucose prescription ( $216.3 \pm 60.0$  vs  $156.5 \pm 53.0$  g/24 h;  $P=0.004$ ) and peritoneal ultrafiltration volume ( $1856 \pm 644$  vs  $658 \pm 781$  ml/24 h,



respectively;  $P=0.0001$ ), the patients with a  $\text{rGFR} < 2 \text{ ml/min}$  showed a higher  $\text{ECW:height}$  compared with the group with  $\text{rGFR} > 2 \text{ ml/min}$  ( $12.5 \pm 3.8$  vs  $9.2 \pm 2.2 \text{ l/m}$ , respectively;  $P=0.003$ ). Fluid state was significantly related to peritoneal transport characteristics and  $\text{rGFR}$ . The larger  $\text{ECW:height}$  in CAPD patients with a negligible  $\text{rGFR}$  existed despite a higher peritoneal ultrafiltration volume and higher peritoneal glucose prescription. These findings raise doubts as to whether fluid state in CAPD patients with a diminished  $\text{rGFR}$  can be adequately controlled on standard glucose solutions without an additional sodium and fluid restriction. The preliminary finding of a relationship between CRP and fluid state might suggest a relationship between overhydration and inflammation.

**Roberto Palla, et.al, (2002)**, studies have provided convincing evidence that in apparently healthy subjects elevated serum levels of plasma C-reactive protein (CRP) are associated with an increased risk of experiencing myocardial infarction and sudden cardiac death. It has been claimed that, in dialytic patients, the hepatic synthesis of this ‘acute phase response’ plasma protein is primarily induced by the macrophage-derived interleukin 6 (IL-6). Little information is available, however, regarding CRP and IL-6 plasma levels in pre-dialytic renal failure. Plasma CRP by a modification of the laser nephelometry technique, IL-6 and serum albumin were determined in 103 chronic pre-dialytic patients (mean age  $50 \pm 6.3$  years; creatinine clearance ( $\text{Cr.cl.}$ )  $36.3 \pm 23.1 \text{ ml/min}$ ). CRP was  $>5 \text{ mg/l}$  (normal upper range) in 42% of the global population. CRP and IL-6 were

significantly related ( $r = 0.35$ ,  $p < 0.0004$ ). CRP and IL-6 were related to renal function (CRP vs. Cr.cl.,  $r = -0.56$ ,  $p < 0.0001$ ; IL-6 vs. Cr.cl.,  $r = -0.55$ ,  $p < 0.0001$ , Spearman correlation coefficient). When patients were divided in tertiles according to renal function, CRP median value resulted 7.9 mg/l (interquartile interval: 5–12) in the first tertile (Cr.cl.  $<18.5$  ml/min), 4.0 mg/l (3–6) in the second tertile (Cr.cl. 18.5–45 ml/min) and 3.2 mg/l (2.7–4.0) in the last tertile (Cr.cl.  $>45$  ml/min) ( $p < 0.0001$ ). A negative correlation between CRP and S-albumin was also found ( $r = -0.52$ ,  $p < 0.0001$ , Spearman correlation coefficient). IL-6 and CRP were increased and were inversely related to creatinine clearance in our population of 103 chronic predialytic patients. The possibility of a decreased renal clearance of CRP and/or cytokines as a cause of an activated acute-phase response is discussed. A negative correlation between CRP and S-albumin was found confirming the link between chronic inflammation and malnutrition in chronic renal patients.

**Mark J Sarnak (2002)**, did a cohort study to evaluate whether the level of kidney function is an independent risk factor for CVD outcomes in the Cardiovascular Health Study (CHS). Cox proportional-hazards regression was used to evaluate the association of predicted glomerular filtration rate (GFR) with CVD after adjustment for the major CVD risk factors. A total of 4893 subjects with predicted GFR of 15 to 130 mL/min/1.73 m<sup>2</sup> were included in the analysis. Fifty-six percent were female and the mean age was 73.4 years. Of the subjects, 549

(11.2%) died and 1229 (25.1%) experienced CVD events in 5.05 years of follow-up. Each 10 mL/min/1.73 m<sup>2</sup> lower GFR was associated with an adjusted hazard ratio for CVD, de novo CVD, recurrent CVD and all-cause mortality of 1.05 (1.02, 1.09), 1.07 (1.01, 1.12), 1.04 (0.99, 1.09), and 1.06 (1.00, 1.12), respectively. There was no significant interaction between level of GFR and other traditional CVD risk factors on CVD outcomes. A linear model best described the relationship between GFR and CVD. The level of GFR is an independent risk factor for CVD, de novo CVD, and all-cause mortality in the elderly.

**Bergner A (2000)**, analyzed RRF in 45 patients with end-stage renal disease (ESRD), commencing either CAPD or HD, to prospectively define the time course of the decline in RRF, and to evaluate dialysis-technique-related factors such as cardiovascular stability and bio incompatibility. Single-center prospective investigation in parallel design with matched pairs. Fifteen patients starting CAPD and 15 matched pairs of patients commencing HD were matched according to cause of renal failure and RRF. Hemodialysis patients were assigned to two dialyzer membranes differing markedly in their potential to activate complement and cells (bioincompatibility). Fifteen patients were treated exclusively with the cuprophane membrane (bioincompatible) and the other 15 patients received HD with the high-flux polysulfone membrane (biocompatible). Residual renal function was determined at initiation of dialytic therapy and after 6, 12, and 24 months. Dry weight (by chest x ray and diameter of the vena cava) was

closely recorded throughout the study, and the number of hypotensive episodes counted. Residual renal function declined in both CAPD and HD patients, although this decline was faster in HD patients (2.8 mL/minute after 6 months and 3.7 mL/min after 12 months) than in CAPD patients (0.6 mL/min and 1.4 mL/min after 6 and 12 months respectively). It declined faster in patients with bioincompatible than with biocompatible HD membranes (3.6 mL/min vs 1.9 mL/min after 6 months). Eleven percent of the HD sessions were complicated by clinically relevant blood pressure reductions, but there were no differences between the two dialyzer membrane groups. None of the CAPD patients had documented hypotensive episodes. The better preservation of RRF in stable CAPD patients corresponded with greater cardiovascular stability compared to HD patients, independently of the membrane used. Furthermore, there was a significantly higher preservation of RRF in HD patients on polysulfone versus cuprophane membranes, indicating an additional effect of biocompatibility, such as less generation of nephrotoxic substances by the membrane. Thus, starting ESRD patients on HD prior to elective CAPD should be avoided for better preservation of RRF.

**Joanne Marshall, RN (2000)**, studied to identify a population at high risk of renal dysfunction with conventional treatment, we selected patients with a creatinine level increased from baseline (within 6 months). We examined the effects of nesiritide on GFR (measured by iothalamate clearance), renal plasma

flow (measured by para-amino hippurate clearance), urinary sodium excretion, and urine output in a double-blind, placebo-controlled, crossover study. Patients received nesiritide (2 µg/kg IV bolus followed by an infusion of 0.01 µg/kg per minute) or placebo for 24 hours on consecutive days. Nesiritide and placebo data were compared by repeated-measures analysis and Student *t* test. We studied 15 patients with a recent mean baseline creatinine of  $1.5 \pm 0.4$  mg/dL and serum creatinine of  $1.8 \pm 0.8$  mg/dL on admission to the study. There were no differences in GFR, effective renal plasma flow, urine output, or sodium excretion for any time interval or for the entire 24-hour period between the nesiritide and placebo study days. For 24 hours, urine output was  $113 \pm 51$  mL/h with placebo and  $110 \pm 56$  mL/h with nesiritide. GFR during placebo was  $40.9 \pm 25.9$  mL/min and with nesiritide was  $40.9 \pm 25.8$ . Nesiritide did not improve renal function in patients with decompensated heart failure, mild chronic renal insufficiency, and renal function that had worsened compared with baseline. The lack of effect may be related to renal insufficiency, hemodynamic alterations, sodium balance, severity of heart failure, or drug dose. Understanding the importance of these issues will permit effective and appropriate use of nesiritide.

**Anderson RG, (1999)** retrospectively examined the effect of nephrectomy on renal function in 55 living related donors. Renal function was measured with <sup>131</sup>iodine-orthoiodohippurate scans. All patients were studied pre operatively, and 1 week and 1 year postoperatively. In 20 patients 10-year follow up was available.

Compensatory hypertrophy was complete 1 week postoperatively: effective renal plasma flow of the remaining kidney was 32.5% higher than preoperatively. The increase remained stable for at least a year. The degree of compensatory hypertrophy was significantly greater in male patients (46.9% after 1 week) than in female patients (26.7%). Compensatory hypertrophy occurred in all age groups studied and it was most pronounced in patients less than 30 years old. In the patients followed for 10 years effective renal plasma flow decreased from 387.7 ml. per minute 1 week after nephrectomy to 367.4 ml. per minute at 10 years. This result is similar to the decrease seen in the normal population. According to our results, renal donation by living related persons does not lead to long-term decrease in renal function

**Farrell PC (1991)**, conducted a retrospective investigation was undertaken in which the rate of decline of residual renal function (RRF), estimated from creatinine clearance, was compared in 55 continuous ambulatory peritoneal dialysis (CAPD) and 57 hemodialysis (HD) patients for whom a minimum of four (mean of 7.6) well-spaced historic measurements of residual clearance were available. Residual function was found to decline exponentially after the onset of therapy in both cohorts. The rate of decline in the HD group was twice that of the CAPD group (5.8% +/- 0.4% per month for HD vs 2.9% +/- 0.3% per month for CAPD; difference significant at  $p$  less than 0.0001). This difference remained highly significant ( $p$  less than 0.01) when corrected for other potential risk factors

such as age, gender, hypertensive status, and use of angiotensin converting enzyme inhibitors in patients with diabetic or other forms of glomerular nephropathy. Differences between cohorts were not significant for patients with other diagnoses ( $p$  greater than 0.1) although the size of some of these subsets was very small. The physiologic mechanism for the more rapid fall-off of RRF on HD remains speculative, but could be related to renal ischemia secondary to intra treatment hypovolemia and/or to nephrotoxic effects of the inflammatory mediators of extracorporeal circulation.

### **III. STUDIES RELATED DIETARY MANAGEMENT OTHER THAN LEACHED POTATO AMONG PATIENTS WITH CHRONIC RENAL FAILURE**

**Sharon Turban, MD (2011)**, conducted a randomized study to look at the benefits and safety of two levels of potassium intake in patients with kidney disease and expect that a higher level of potassium intake safely lowers blood pressure compared to a lower level of potassium intake. there is great uncertainty about the optimal K intake in CKD patients. K is often restricted in these patients due to concerns about elevating serum K. However, renal K excretion does not appear to be substantially impaired until the glomerular filtration rate (GFR) is severely decreased ( $< 10\text{-}20 \text{ mL/min/1.73 m}^2$ ). In this randomized feeding study with a two-period crossover design, the benefits and safety of 4 weeks of 100 mmol versus 40 mmol K/day in 26 non-diabetic adults with stage 3 CKD

(estimated GFR 30-59 mL/min/1.73 m<sup>2</sup>) was evaluated. After a one-week run-in period, all participants received either a diet containing either 40 mmol K/day or 100 mmol K/day. Student's 't' test reveals the significance of potassium in lowering blood pressure among patients with chronic renal failure, ( $P < 0.05$ ).

**Amato D (2005)**, done a study to test the effect of zinc supplementation on the nutritional status of patients on continuous ambulatory peritoneal dialysis (CAPD). Double-blinded randomized controlled clinical trial. Twenty-five patients with end stage renal disease (ESRD) on CAPD program, from 16 to 60 years old were studied. Two weeks before the beginning of the study all the drugs with a known effect on zinc absorption were withdrawn. Patients were randomly allocated into one of two groups. The control group consisted of 12 patients receiving placebo, and the intervention group of 13 patients receiving 100 mg/day of elemental zinc for 3 months. The diet was individually adjusted to 35 kcal/kg/day, and 1.5 g/day of proteins. Subjective global assessment (SGA), anthropometric measurements, electric bioimpedanciometry, measurements of albumin, prealbumin, and transferrin, and evaluation of energy, proteins, carbohydrates, and lipids consumption were done to classify the nutritional status at the beginning and at the end of the study. Therapeutic compliance was assessed by measuring plasma zinc levels and by capsule counting. There were no statistically significant differences between groups regarding age, gender, time on CAPD, and ESRD causes. The proportion of patients classified as well nourished,



or with mild or moderate malnutrition by SGA did not show significant differences between the group receiving Zn supplementation and the group receiving placebo. Anthropometric measurements and body composition assessed by bioelectric impedance were similar in the two groups. In the control group, serum levels of albumin (3,621  $\pm$  838 vs. 3,068  $\pm$  842 mg/dL), prealbumin (49  $\pm$  14 vs. 44  $\pm$  12 mg/dL), and transferrin (238  $\pm$  94 vs. 195  $\pm$  79 mg/dL) decreased significantly at the end of the follow-up period respect to the baseline values ( $p < 0.05$ ). In the intervention group albumin (3,320  $\pm$  910 vs. 2,696  $\pm$  964 mg/dL), prealbumin (43  $\pm$  9 vs. 38  $\pm$  8 mg/dL), and transferrin (236  $\pm$  99 vs. 193  $\pm$  66 mg/dL) also decreased significantly ( $p < 0.05$ ). In the control group baseline zinc level was low (60  $\pm$  5 micrograms/dL) and remained stable along the follow-up period, while in the intervention group it increased from 52  $\pm$  5 (baseline) to 92  $\pm$  9 micrograms/dL (end of the follow-up,  $p < 0.05$ ). Zinc supplementation did not improve the nutritional status in patients on CAPD.

**Salahudeen AK (2004)**, conducted a study to examine the effects of dietary protein restriction in patients with chronic rejection. Fourteen patients with biopsy proven chronic rejection, who had been on a self-selected home diet of 1.0  $\pm$  0.1 g protein/kg/day, were randomly assigned, using a crossover design to two 11-day periods, one on a low protein diet (0.55 g/kg/day) and the other on a high protein diet (2 g/kg/day). The effect of these diets on renal hemodynamics, proteinuria, plasma renin activity, and nutritional status was examined. The low

protein diet was associated with a significant improvement in glomerular permselectivity in all patients as evidenced by a significant fall in the fractional clearance of albumin and IgG and reduction in 24-hour urinary excretion of total protein, albumin and IgG without any change in blood pressure, glomerular filtration rate, or renal plasma flow. Compared to the proteinuria at the beginning of each diet, a high protein diet did not increase but a low protein diet significantly decreased the proteinuria. The low protein diet was also associated with a significant reduction in plasma renin activity, suggesting that part of the beneficial effect of protein restriction was related to the suppression of the renin-angiotensin system.

**Milovanova LIu (2004)**, studied to assess the rate and clinical significance of impaired nutritional status and impact of low-protein diet on inhibition of renal insufficiency in patients of stage III-IV chronic disease of the kidneys (CDK). A total of 200 patients with CDK stage III-IV were randomized into three groups: group 1 consisted of 123 patients with chronic glomerulonephritis (73 with stage III and 50 with stage IV), group 2--45 patients with systemic diseases (30 with stage III and 15 with stage IV), group 3 (a comparison group)--32 patients with CGN (17 with stage III and 15 with stage IV). Patients of groups 1 and 2 received low-protein diet (0.6 g protein/kg/day) balanced by either high-calorie mix containing protein SUPRO 760 or ketosteril for 24-48 months. The nutritional status was studied by anthropometric data, absolute number of lymphocytes, levels

of blood albumin and transferrin, intake of protein, food calorie value according to 3-day diaries. Among 200 patients impaired nutritional status was detected in 22 (11.0%) patients. More than half of them had glomerulonephritis in systemic diseases (SLE, systemic vasculitis). Only in patients with systemic diseases nutritional disorders manifested at stage III. These disorders grew with progression of renal insufficiency and were detected primarily in patients with stage IV CDK. Patients with CGN on low-protein diet for a year and longer demonstrated slowing of the fall of the glomerular filtration rate (GFR). Early (predialysis) use of low-protein diet balanced by addition of amino- and keto-acids and high-energy nutritional mixes has a positive influence on nutritional status of patients with chronic renal insufficiency and can inhibit GFR lowering.

**Jauregui Ontiveros B (2003)**, studied 12 patients treated during a year with weekly intermittent dialysis with a rigid catheter for 36 hours a week. Patients were on a diet of 50 g. of proteins a day, normocaloric without sodium or fluid restriction. They received supplementation with iron, calcium, vitamins B, C and folic acid, anabolic hormonal and, in some cases, furosemide hypotensives and antibiotics. Patients received the procedure for a mean of 8 months. The results show the following mean values: blood pressure: 143 +/- 12/99 +/- 3 mm. Hg., plasma urea 208 +/- 62 mg./dl.; creatinine 21 +/- 2 mg./dl., hematocrit 25 mm. and 8.0 g. hemoglobin. There was light increase of glucose, K, P, Mg, alkaline phosphatase. Na, CO<sub>2</sub>, proteins cholesterol, albumin and Ca keep in normal

values. Nine patients passed to hemodialysis after a mean period of nine months and three of them received a kidney transplant. Three are still in peritoneal dialysis, one of them for 18 months. We compared our results with a similar group of patients who were treated with non-regular peritoneal dialysis. Our group had less cardiovascular complaints, or infections and keep more adequate body weight, and also got more survival in better conditions with less days in hospital, they received less blood transfusion. We concluded that weekly peritoneal dialysis is an alternative method of treatment in uremic patients for longer period of time even though frequently Paracentesis.

**Lysenko LV (2003)**, studied to evaluate the effects of low-protein diet (LPD) balanced by addition of highly energetic mix and essential keto/amino acids on inhibition of renal failure in patients with systemic diseases with predialysis stages of chronic disease of the kidney (CDK). Forty six patients with stage III--IV of CDK in systemic diseases (33 SLE patients and 13 with systemic vasculitis) were randomized into three groups. Group 1 consisted of 18 patients with CDK (10 with stage III and 8 with stage IV). They received LPD (0.6 g/kg/day) with addition of essential keto/amino acids for 24-48 months. Group 2 of 18 CDK patients with the same stages received the same diet but greater amount of vegetable protein (highly purified soya protein) to 0.3 g/kg/day in highly energetic nutrient mixture. Group 3--10 CDK patients (7 with stage III and 3 with stage IV) received free diet. Group 1 and 2 patients received LPD irrespective of the nutrient

status assessed basing on anthropometric and other data. Protein consumption and caloric value were estimated by 3-day food diary. Before diet therapy, out of 46 examinees nutrient status was abnormal in 45.7% patients. Both variants of LPD were well tolerated and nutrient status was corrected while the rate of nutritive disorders in group 3 increased 1.5-fold (from 40 to 60%) with progression of renal failure. Intake of LPD diet for at least a year reduced glomerular filtration rate inhibition, especially in addition of highly energetic mixture. Early (predialysis) restriction of diet protein (0.6 g/kg/day) with addition of highly energetic mixture and essential keto/amino acids improves a nutritive status of CDK patients and inhibits GFR decline.

**Lee SH (2002)**, did a cross-sectional study to examine dietary and fluid compliance behaviors in Chinese hemodialysis (HD) patients in Hong Kong and identified variables related to compliance. Sixty-two chronic HD patients participated and information was obtained about their knowledge of dietary and fluid restrictions related to dialysis, health beliefs, personal and medical characteristics, and self-reported compliance. In addition, serum levels of potassium (K) and phosphate (PO(4)) and interdialytic daily weight gain were retrieved from the medical records. Dietary and fluid compliance was observed in only 35.5% and 40.3% of the patients, respectively. No direct relationship was observed between dietary knowledge and any compliance measures.. Residual urine output volume was positively correlated with the level of fluid compliance.

Patients with more hours on HD per week were found to be more fluid noncompliant. Working patients and those whose diet was prepared by someone else in the family were also more likely to be noncompliant. Health professionals should be aware of the factors behind noncompliance in HD patients and assist them in making life-style changes. Patient education with family involvement, identification of at-risk patients for noncompliance and assisting patients to identify and manage difficulties with life-style changes related to HD are important elements in promoting compliance.

**Bustamante J (2000)**, concluded Patients with kidney failure are a high nutritional risk group. Patients with acute kidney failure need and energy intake of 30-40 kcal/kg and a protein intake of 0,8-1 g/kg of ideal weight, that it is increased with glomerular filtration improvement. Potassium must be limited to 30-50 mEq/day and sodium to 20-40 mEq/day in oliguric phase, and must be replaced the losses in diuretic phase. Specific recommendations have been designed to some nutrients. A diet with 0.75-1 g/kg/day of proteins must be recommended in patients with chronic kidney failure (CDF). Low protein diets (<0.6 g/kg/day) are not justified, due to a possible malnutrition might be developed (A). In patients with haemodialysis, energy requirements are 35 Kcal/kg/day. Protein recommendations are 1.2-1.4 g/Kg/day. Water recommendations depend of residual diuresis. 500-800 ml must be added to residual diuresis. Sodium must limited to 60-100 meq/day, with a depth reduction of water and sodium in anuric

patients. Potassium must be under 1 meq/kg/day. Patients with peritoneal dialysis had different dietary recommendations. Protein recommendations are higher than previous (1.5 g/Kg/day). Energy recommendations from carbohydrates must be included glucose of dialyser liquid (60% of total amount). Diet has low restrictions due to the daily sessions of peritoneal dialysis, for example potassium intakes can reach 2000-3000 mg/day. Hydrosoluble vitamin losses are lower than patients with haemodialysis.

**Priasca G (2000)**, conducted a study to analyze the possibility of applying a once-a-week dialysis programme supplemented with hypoproteic diet as an adequate technique for starting the uraemic patient on dialysis is examined. Thirteen patients have been so treated, 7 of them currently under treatment for a global period of observation of 46 months. At the moment dialysis began, mean glomerular filtrate was 5.14 ml/min. Once-a-week dialytic treatment with bicarbonate dialysis was associated with a hypoproteic diet of 0.5 g/kg/die of proteins, supplemented with essential amino acids. This treatment showed excellent dialytic tolerance, the values of dialysis start blood nitrogen were lower than 200 mg/dl and dialytic efficiency was compatible with a Kt/v greater than 1.1. There was no observation of any subjective or objective symptomatology that could be related to dialytic inadequacy. Taken as a whole these results make it possible to state that this type of approach permits a gradual start to dialysis and deserves further study.

**Rosman JB (1984)**, conducted a prospective randomized trial has been in progress since April, 1982. In 1984, we reported a general beneficial effect of o diet after two years of follow-up. 248 patients with initial creatinine clearances between 10 and 60 ml/min entered the trial. Patients were stratified for sex, age and degree of renal insufficiency. 129 patients were randomly assigned to a DPR-group (0.4 to 0.6 g/kg/day); 118 patients to a control group. Patients on DPR visited the dietitian every three months during the first 24 months of the study; thereafter, as with the controls, the dietitian visits were only for specific needs. Urea excretion decreased significantly in DPR patients as a sign of good compliance and stayed at that level, even without frequent visits to the dietitian. Biochemical parameters showed no signs of malnutrition. Amino acid profiles were related to the degree of renal failure. The diet appeared to have a selective effect on the progression rate of renal failure: only patients with primary glomerular disease responded to the diet.

#### **IV. STUDIES RELATED TO LEACHED POTATO ON RENAL FUNCTION AMONG PATIETNS WITH CHRONIC RENAL FAILURE**

**Anderson J B (1997)**, In an effort to increase variety, flexibility and compliance to the nutritional protocols for dialysis patients, this study investigated ways to optimize leaching of potassium from fresh potatoes. Potatoes were processed in a



variety of methods including size of slices, duration of soaking, temperature of soaking, agitation while soaking, volume of water, addition of leaching agents, and cooking methods. Agitation, temperature of soaking water and addition of leaching agents did not significantly increase the amount of potassium that was leached out. Maximal loss of potassium was achieved when 4 mm sliced potatoes were pressure cooked for 7 minutes in a volume of water ten times that of the volume of the potatoes. The potassium content of raw, boiled, microwaved and pressure cooked potatoes per 100 gram serving were: 380( $\pm$ 54) mg, 76( $\pm$ 7) mg, 46( $\pm$ 5) mg, 29( $\pm$ 6) mg respectively. Raw potatoes contained 380( $\pm$ 54) mg of potassium per 100 gram serving. The pressure cooked potatoes contained 29( $\pm$ 6) mg of potassium per 100 gram serving. Sensory analysis of the products was conducted on 92 hemodialysis subjects at three dialysis centers. Overall acceptability of reduced potassium potatoes was found to be excellent. It is optimal household methods for reducing potassium content of potatoes for dialysis patients.

## **CHAPTER - III**

### **RESEARCH METHODOLOGY**

Research methodology is a significant part of any study which enables the researcher to project the research undertaken. Research methodology is the systemic way to carry out an academic study. The methodology enables the research to project a blue print of the details, data, approach; analysis and findings of research undertaken, (**Abdulah, 1979**).

The present study was conducted to evaluate the role of leached potato on renal function among patients with chronic renal failure.

This chapter includes research approach, research design, setting of the study, variables, population, sample, sample size, sampling techniques, criteria for the sample selection, developing and description of tool, data collection procedure, plan for data analysis and interpretation of the data.

### **RESEARCH APPROACH**

Research approach is the most essential part of any research. The entire study is based on it. The research approach used in the study is an applied form of research to find out how well the intervention is effective. In this study, the

effectiveness of leached potato on renal function was evaluated. Therefore an evaluation approach was essential to test the effectiveness of the intervention.

## **RESEARCH DESIGN**

Research design incorporates the most imported methodological decisions that a researcher makes in conducting a research study. It depicts the overall plan for organization of scientific investigations. It helps the researcher in the selection of subjects, manipulation of independent variables and observation of a type of statistical method to be used to interpret the data. The selection of the design depends upon the purpose of the study, research approach and variables to be studied. **(Polit and Hungler, 2003).**

The research design used for the present study was quasi experimental design where one group pre and posttest with control group design was selected to evaluate the effectiveness of leached potato on renal function among patients with chronic renal failure.

**Fig 3.1 Diagrammatic Representation of the Research Design**

Purposively selected Patients renal failure	Pretest	Intervention	Posttest
Experimental group	O <sub>1</sub>	X	O <sub>2</sub>
Control Group	O <sub>3</sub>	-	O <sub>4</sub>

**The symbols used are,**

**O<sub>1</sub>**-Pretest on renal function among patients with chronic renal failure in experimental group.

**X**- Leached potato

**O<sub>2</sub>**- Posttest on renal function among patients with chronic renal failure in experimental group.

**O<sub>3</sub>**-Pretest on renal function among patients with chronic renal failure in control group.

**O<sub>4</sub>**-Posttest on renal function among patients with chronic renal failure in control group.

## SETTING OF THE STUDY

Research settings are specific places in a research where data collection is to be made. The selection of setting was done on the basis of the feasibility of conducting the study, availability of subject and permission of authorities, (**Polit and Hungler, 2003**).

Setting for the present study is **Nallaswamy Kidney Centre, Erode**, which is 25kms away from Dhanvantri College of nursing.

This hospital is 100 bedded and has a separate dialysis unit where 35-40 dialyses are performed per day. The total patients who undergo dialysis are around 45-50 per month which includes both outpatients and inpatients. The total number of inpatient dialysis is about 10-15 per month and the rest accounts for outpatients.

## VARIABLES

Variables are characters that can have more than one value. The categories of variables discussed in the present study are,

### **Independent Variable**

According to **Polit and Hungler (1999)**, the variable that is believed to care or influence the behaviour and ideas.

In this present study, the independent variable refers to leached potato

## **Dependent Variable**

According to **Polit and Hungler (1999)**, the dependent variable is the researcher is interested in understanding, explaining, and proceeding.

In this present study, the dependent variable refers to renal function.

## **POPULATION**

Population refers to the entire aggregation of cases that meets the design criteria, (**Polit and Beck, 2002**)

The population for the present study was patients with chronic renal failures present during the period of data collection.

## **SAMPLE**

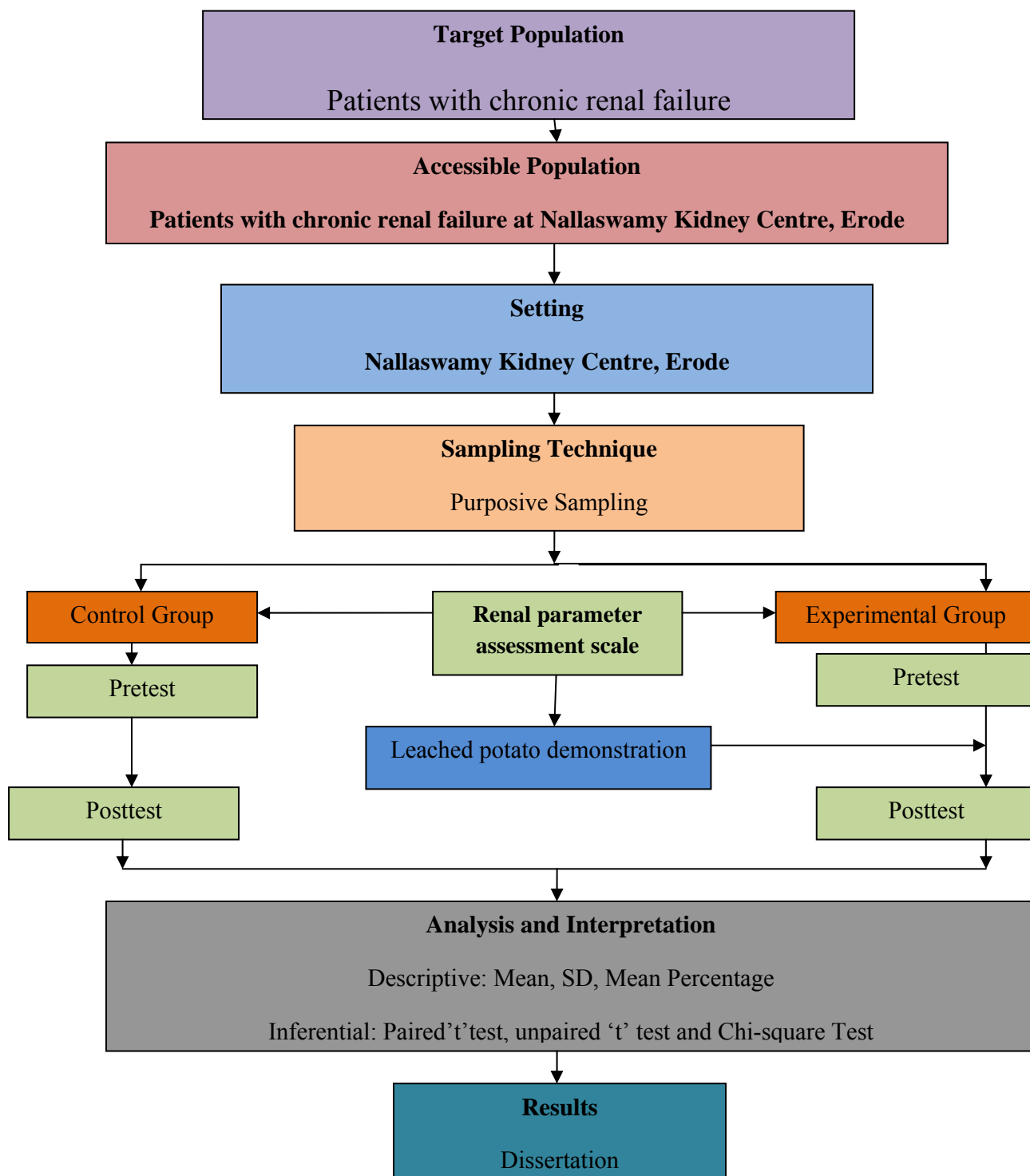
A sample is the portion of the population that has been selected to represent the population of interest , (**Talbott, 1991**).

The sample for the present study was patients with chronic renal failure, who are outpatient in Nallaswamy Kidney Centre, Erode, willing to participate and present during the period of data collection.

## **SAMPLE SIZE**

Sample size is normally decided by nature of the study, nature of the population, type of sampling technique, total variable, statistical test adopted for data analysis and sensitivity measures and attrition, (**Polit and Beck, 2001**)

The total sample size was 30 patients with chronic renal failure, out of which 15 were control group and 15 were experimental group.



**FIG: 3.2 SCHEMATIC REPRESENTATION OF RESEARCH METHODOLOGY**



## **SAMPLING TECHNIQUE**

Sampling is the process of selecting a portion of the population who represent the entire population, **(Polit and Beck, 2001)**.

In this present study, Purposive sampling technique was used to select all patients with chronic renal failure in a Nallaswamy Kidney Centre, Erode and was outpatients during the period of data collection.

Purposive sampling means selection of samples by choice, not by chance. **(Basvanthappa. B.T, 2007)**

## **SAMPLING CRITERIA**

### **⇒ Inclusion Criteria**

#### **Patients with Chronic Renal Failure**

1. Who are under age group of 20-60 years.
2. Both gender
3. 3<sup>rd</sup> and 4<sup>th</sup> stage of chronic kidney disease
4. Who are willing to participate in the study
5. Who are present during the period of data collection

6. Who are only outpatients in Nallaswamy Kidney Centre, Erode.

### ⇒ **Exclusion Criteria**

#### **Patients with Chronic Renal Failure**

1. Type 1 diabetes mellitus
2. Who are allergic to potato
3. Who dislikes potato
4. Who are not consistent with the intervention.

## **DEVELOPMENT OF THE TOOL**

There are 2 sections of tools are used. They are;

### **SECTION A**

It consists of demographic characteristics of patients with chronic renal failure, i.e;

1. Age in years
2. Gender
3. Educational status

4. Marital status
5. Food habits
6. Duration of illness(months)
7. Period of dialysis procedure (months)
8. Causes of illness.

## **SECTION B**

This consists of renal function parameter assessment scale. It consists of seven parameters like urinary output in 24 hours, systolic BP, diastolic BP, weight loss, potassium, creatinine, edema.

### RENAL FUNCTION PARAMETER ASSESSMENT SCALE.

RENAL FUNCTION PARAMETER	SCORES			
	1	2	3	4
URINARY OUTPUT IN 24 HRS	BELOW 300	301-500	501-700	ABOVE 700
SYSTOLIC BLOOD PRESURE	>180	160-179	140-159	<140
DIASTOLIC BLOOD PRESSURE	>110	110-101	100-109	<90
WEIGHT LOSS IN Kg	<2	2-3.9	4-5.9	>6
SERUM POATSSIUM	>11	11-9	8.9-6.9	>5
SERUM CREATININE	>7	7-6.6	6.5-6.1	>6
EDEMA	+4	+3	+2	+1

## SCORING PROCEDURE

Based on the percentage of scores the level of renal function was graded in 3 categories. They are “**Highly impaired**”, “**Moderately impaired**” and “**Mildly impaired**”.

**Table 3:1 Level of renal function based on percentage of scores**

<b>Level of renal function</b>	<b>Actual Score</b>	<b>Percentage (%)</b>
Highly impaired	7 – 14	25 - 50%
Moderately impaired	15 – 21	51 - 75%
Mildly impaired	22 – 28	76 - 100 %

## VALIDITY

The content validity of demographic variables and assessment tool for renal function parameter assessment scale was validated in consultation with guides and experts. The experts were nursing personnel’s, Nephrologists, Dietician and statisticians. The tool was modified according to the suggestions and recommendations of the experts, (**Appendix III**)

## **RELIABILITY**

The reliability of the renal function parameter assessment scale was tested by implementing the tool on patients with chronic renal failure who are outpatients in dialysis unit in Government Head Quarters Hospital, Erode, which is other than the sample area. Split Half method (Spearman Brown man formula) was used to test the reliability of the tool and the tool was found to be reliable. ( $r^1 = 0.75$ )

## **DATA COLLECTION PROCEDURE**

Data collection is the gathering of the information to address the research problem. The word “data” means information i.e. systematically collected in the course of study.

**Talbott (1995)** refers data collection as gathering of information from the sampling unit. The researcher plan typically specifies procedures for actual collection of data. The researcher must be sure that enough material is available to complete the study that the participants are informed that the schedules do not conflict.

### **Permission from the concerned authority**

Prior to the collection of the data, permission was obtained from the Administrative Officer of Nallaswamy Kidney Centre, Erode, (**Appendix-II**)

**Period of data collection**

The data was collected from 15.08.2011 to 15.09.2011. The investigator collected the data from both experimental and control group. The first 15 patients with chronic renal failure was experimental group whereas the next 15 patients with chronic renal failure were control group. The reason for selecting samples like this is to avoid the contamination of the samples in experimental group with control group.

**Pretest**

Pretest was conducted on patients with chronic renal failure in the dialysis unit by using renal function parameter assessment scale to assess the level of renal function. In an average daily 8 patients were assessed.

**Implementation of leached potato**

Immediately after pretest, Leached potato cooking demonstration was done on the first day of visit. The cooking demonstration was shown only once for 10 minutes. The patients are advised to take 100mg of leached potato for six days in a week. The patient's consistency with intervention is tracked and confirmed by making phone calls and diary system.

### **Posttest / Evaluation of leached potato.**

Posttest was conducted at the end of the sixth day of intervention using renal function parameter assessment scale among patients with chronic renal failure.

### **PLAN FOR DATA ANALYSIS**

- ✓ The level of renal function among patients with chronic renal failure in experimental and control group of patients before and after leached potato was analyzed by using **frequency and percentage**.
- ✓ The changes in renal function among patients with chronic renal failure in experimental and control group after leached potato was analyzed by using **mean, standard deviation, mean percentage, pair ‘t’ test and unpaired ‘t’ test**.
- ✓ The association between posttest scores of renal function among experimental group and control group of patients with chronic renal failure with their demographic variables was analyzed by using **chi-square test**.



## **SUMMARY**

A quasi-experimental design was carried on 30 patients with chronic renal failure admitted in Nallaswamy Kidney Centre, Erode by using purposive sampling technique. The renal function parameter assessment scale was used to assess the level of renal function among patients with chronic renal failure. The data were collected after obtaining permission from the administrative officer of Nallaswamy Kidney Centre, Erode. Data were planned to analysis by using descriptive and inferential statistics and to be presented in the form of table, figures and graphs.

## **CHAPTER –IV**

### **DATA ANALYSIS AND INTERPRETATION**

Analysis is a “process of organizing and synthesizing data in such a way that research questions can be answered and hypothesis tested”, **(Polit and Hungler, 2003).**

Analysis enables the researcher to reduce, summarize, organize, evaluate, interpret and communicate numerical information, **(Polit and Hungler, 2003).**

This chapter deals with the analysis and interpretation of data collected from 30 (15 control group and 15 experimental group) patients with chronic renal failure by using purposive sampling technique from Nallaswamy Kidney Centre, “to evaluate the role of leached potato on renal function.

The data were coded and analyzed as per objectives of the study under the following headings;

1. **Section A:** Description of samples characteristics.

2. **Section B:** Assess the level of renal function among control and experimental group of patients with chronic renal failure before and after leached potato.

- ❖ Frequency and percentage distribution of the control group pre and posttest scores of renal function among patients with chronic renal failure.
- ❖ Frequency and percentage distribution of the experimental group pre and posttest scores of renal function among patients with chronic renal failure.
- ❖ Frequency and percentage distribution of posttest scores of renal function among patients with chronic renal failure in control and experimental group.

3. **Section C:** Determine the changes in renal function among patients with chronic renal failure in experimental and control group after leached potato.

- Paired ‘t’ test value of pre and posttest scores of experimental group.
- Area wise comparison of mean, SD, and mean percentage of control group and experimental group pre and posttest scores
- Unpaired ‘t’ test value of pre and posttest scores of control group.

- Unpaired 't' test value of pre and posttest scores of experimental group.
- Area wise comparison of mean, SD and mean percentage of control and experimental group posttest scores.

4. **Section D:** Find out the association between posttest scores of renal function among control and experimental group of patients with chronic renal failure with their demographic variables.

- Chi-square value of association between control group posttest scores with their demographic variables.
- Chi-square value of association between experimental group posttest scores with their demographic variables.

## SECTION-A

### DESCRIPTION OF SAMPLES CHARACTERISTICS

**Table-4.1 Frequency and percentage distribution of control and experimental groups of patients with chronic renal failure according to their demographic variables**

**(N<sub>1</sub> = 15, N<sub>2</sub> = 15)**

Demographic variables	Control group		Experimental group	
	Frequency (N <sub>1</sub> )	Percentage (%)	Frequency (N <sub>2</sub> )	Percentage (%)
<b>1.Age in years</b>				
a) 20-40 years	7	47	4	27
b) 40-60 years	7	47	8	53
c) Above 60 years	1	6	3	20
<b>2. Gender</b>				
a) Male	11	73	9	60
b) Female	4	27	6	40
<b>3. Educational status</b>				
a) No primary education	2	13	0	0
b) Primary	0	0	1	6
c) Higher secondary	6	40	4	27
d) Degree	7	47	10	67

<b>4. Marital status</b>				
a) Unmarried	1	6	2	13
b) Married	13	87	11	73
c) Widow (or) widower	1	7	2	13
<b>5. Food habits</b>				
a) Vegetarian	2	13	2	13
b) Non- vegetarian	0	0	0	0
c) Mixed.	13	87	13	87
<b>6. Duration of illness(in years)</b>				
a) 1-2	1	7	0	0
b) 2-3	5	33	2	13
c) 3-4	8	53	4	27
d) above 4	1	7	9	60
<b>7. Period of dialysis(in years)</b>				
a) 1-3	3	20	1	6
b) 3-5	9	60	10	67
c) 5-7	3	20	4	27
d) Above 7	0	0	0	0
<b>8. Cause of illness</b>				
a) Nephrotoxicity	11	74	9	60
b) Drug toxicity	0	0	0	0
c) Diabetes mellitus	2	13	3	20
d) Hypertension	2	13	3	20
e) Others	0	0	0	0

**Table 4.1** Reveals the frequency and percentage distribution of patients with chronic renal failure according to their demographic variables.

Distribution of control and experimental group samples according to their age group depicts that the highest percentage (47% and 53%) of patients were in the age group of 41-60 years in both the groups however 47% and 27% of patients with from each group were in the age group of 20-40 years and only 6% and 20% of patients from each group were in the age group of above 60 years. **(Fig:4.1).**

Distribution of control and experimental group samples according to gender reveals that most (73% and 60%) of patients were male in both the groups and only 27% and 40% of patients were female in both the groups. It might be associated that males are affected more than the females. **(Fig:4.2).**

Distribution of control and experimental group samples according to their educational status reveals that highest percentages (47% and 67%) of the patients were degree holder in both the groups, 40% and 27% of patients had higher secondary education in both the groups, 6% of patients in experimental group had primary education and 13% of patients with chronic renal failure in control group had no formal education. It might be the place of study. **(Fig:4.3).**

Distribution of control and experimental group samples according to their marital status reveals that most (87% and 73%) of the patients from both the groups were married. However similar percentages (13%, 13%, 7% and 7%) of the patients in both the groups were unmarried and widowed respectively **(Fig:4.4).**

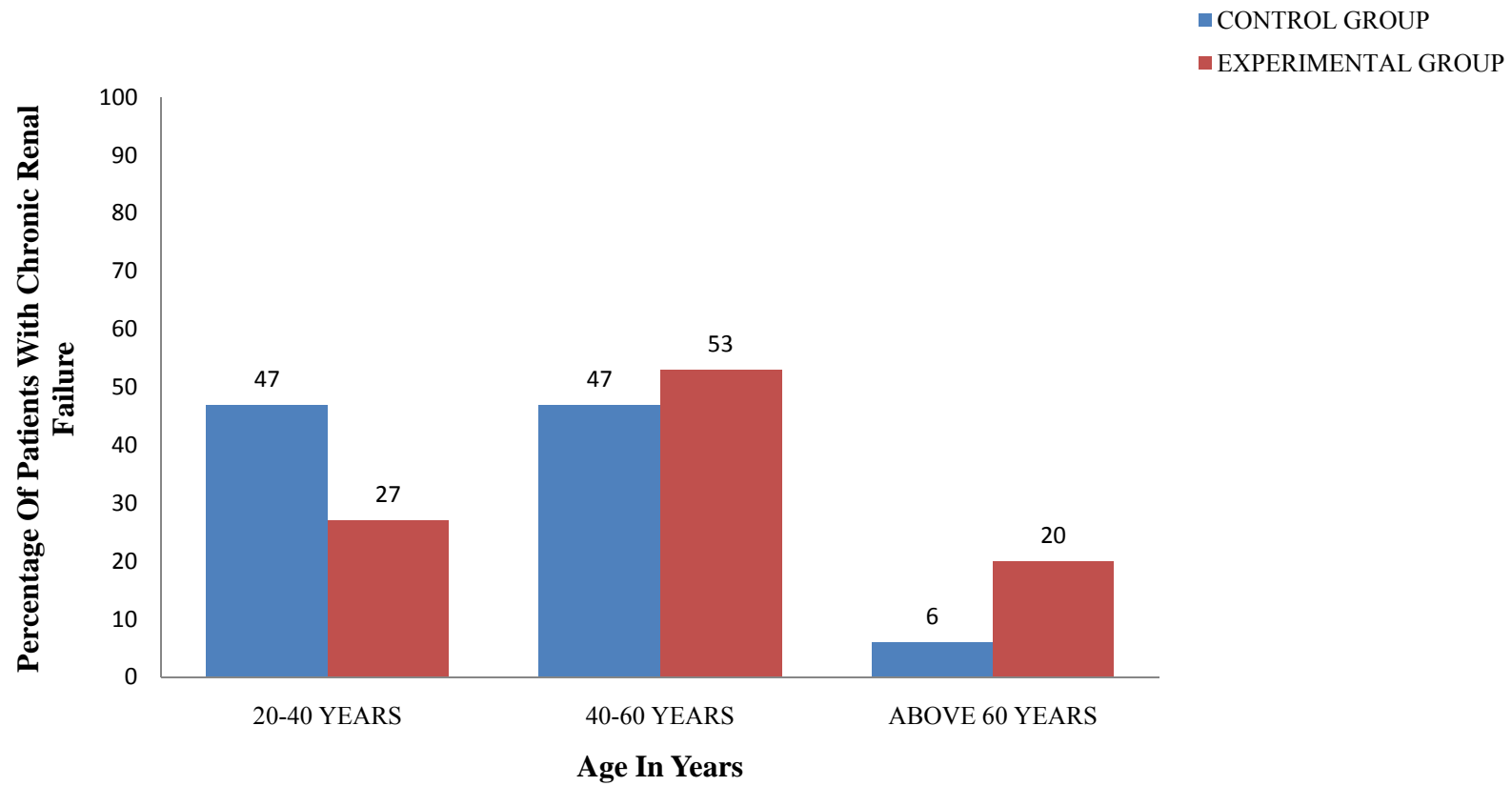
Distribution of control and experimental samples groups according to their food habits reveals that highest similar percentages (87%) of patients from both group had mixed food habits and similar percentage (13%) of patients from both group were vegetarian. **(Fig.4.5).**

Distribution of control and experimental group according to the duration of illness in years depicts that the highest percentage (53% and 27%) of patients from both groups had 3-4 years of illness. However higher percentages (33% and 13%) of patients from both group had 2-3 years of illness, whereas only 7% of patient from control group and 60% of patient from experimental group had above 4 years of illness. It might be associated that most of them had 3-4 years duration of illness. **(Fig.4.6).**

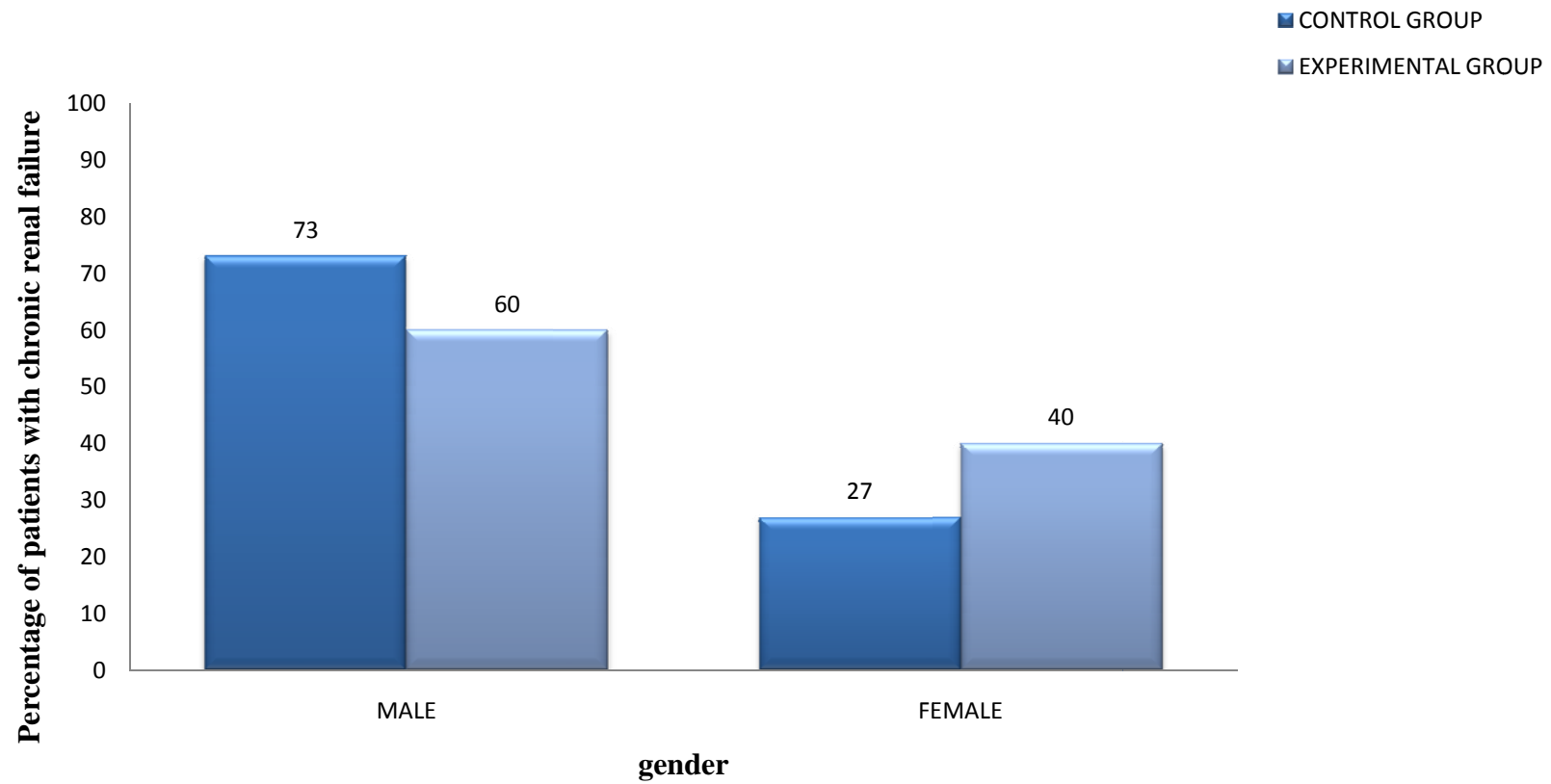
Distribution of control and experimental group according to their period of illness reveals that the highest percentage (60% and 67%) of patients had dialysis for 3-5 years in both the groups. However higher percentage( 20% and 27% )of patients had dialysis for 5-7 years in both the group and only 20% and 6% of patients had 1-3 years period of dialysis. **(Fig.4.7).**

Distribution of control and experimental group according to their causes of illness depicts that the highest percentage (74% and 60%) of patients had illness due to Nephrotoxicity. However similar percentage (20%,20%,13%, and 13%) of patients in both the groups had illness due to diabetic mellitus and hypertension respectively.**(Fig.4.8)**

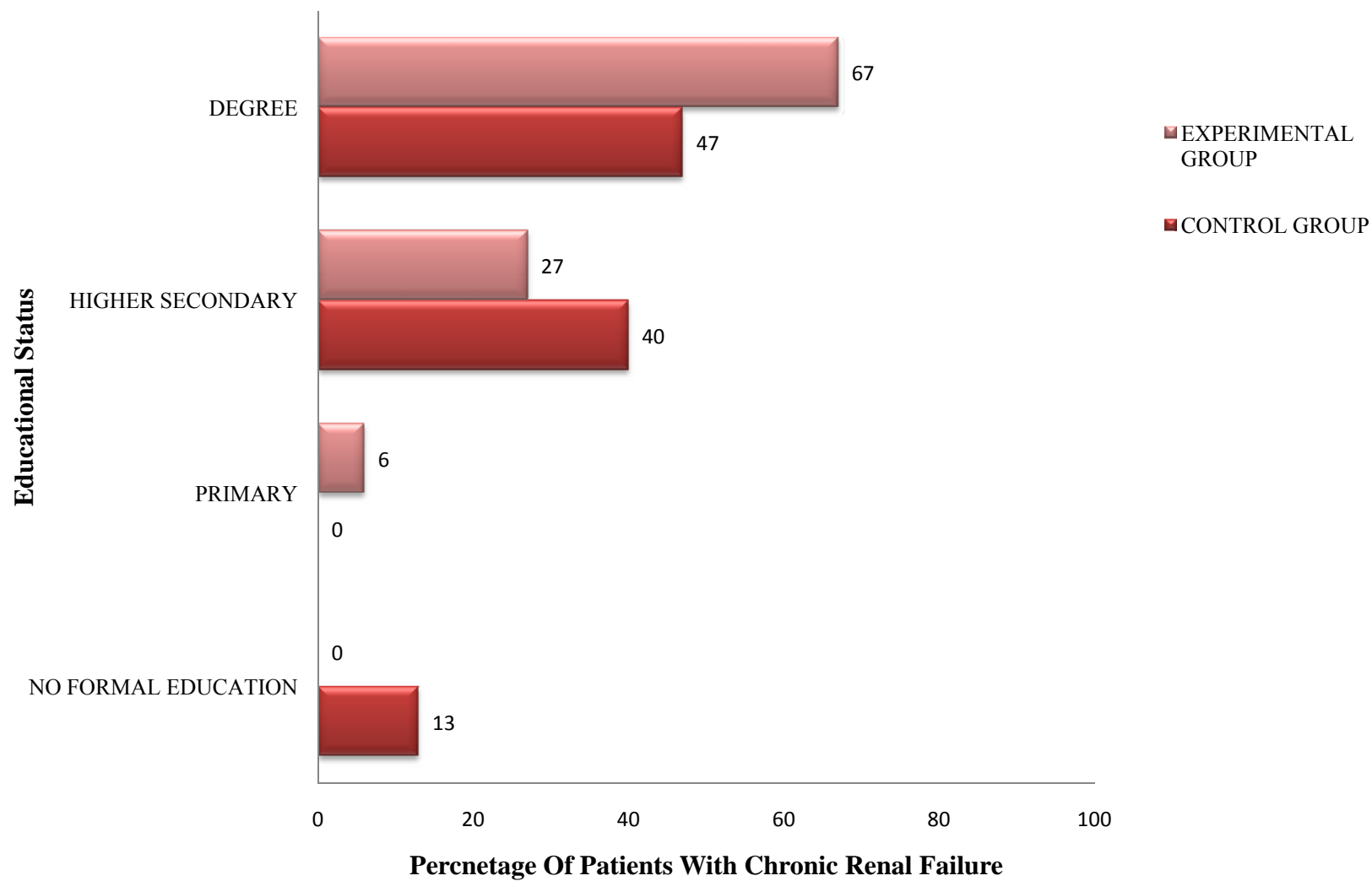




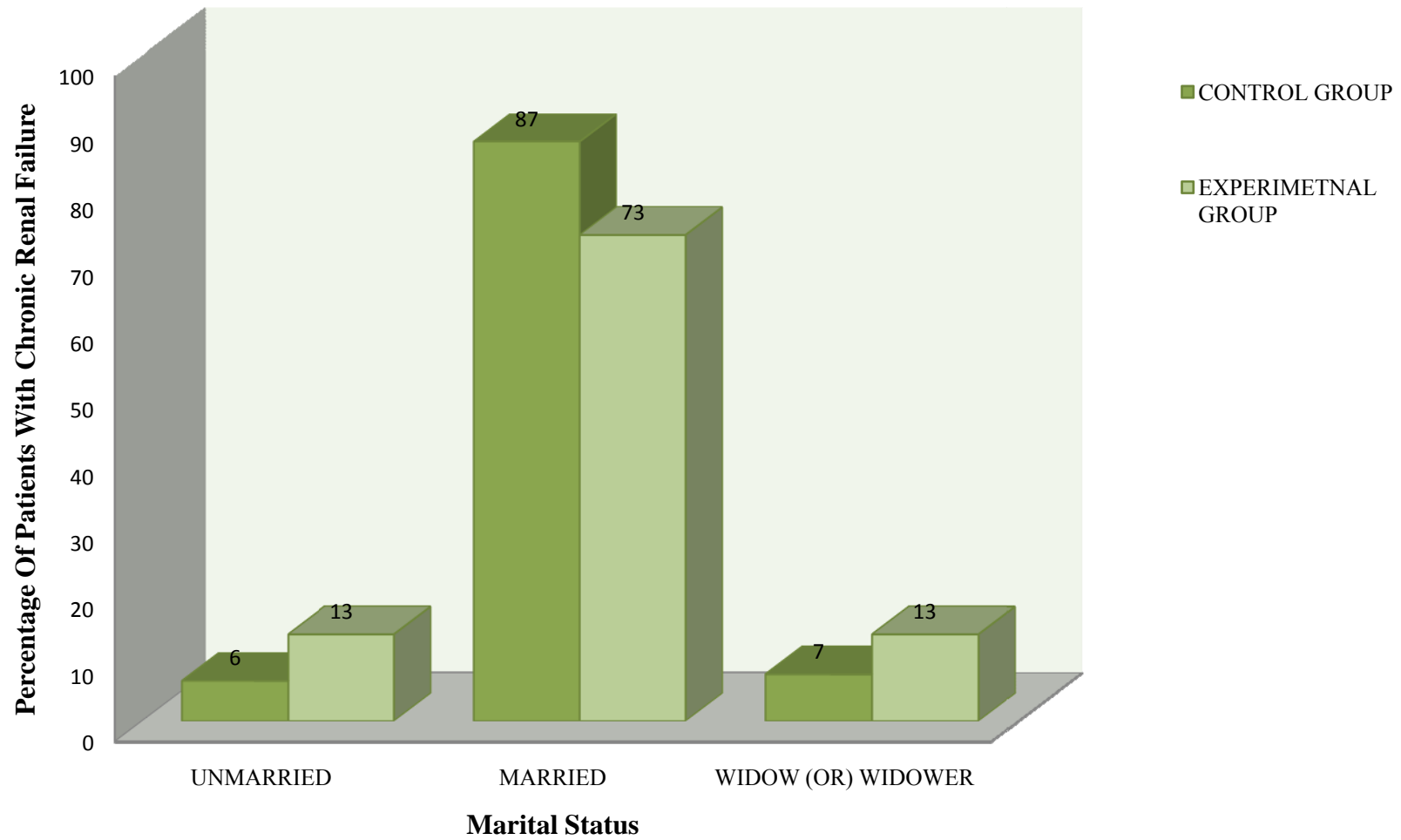
**Fig.4.1** Bar diagram shows the percentage distribution of patients according to their age group.



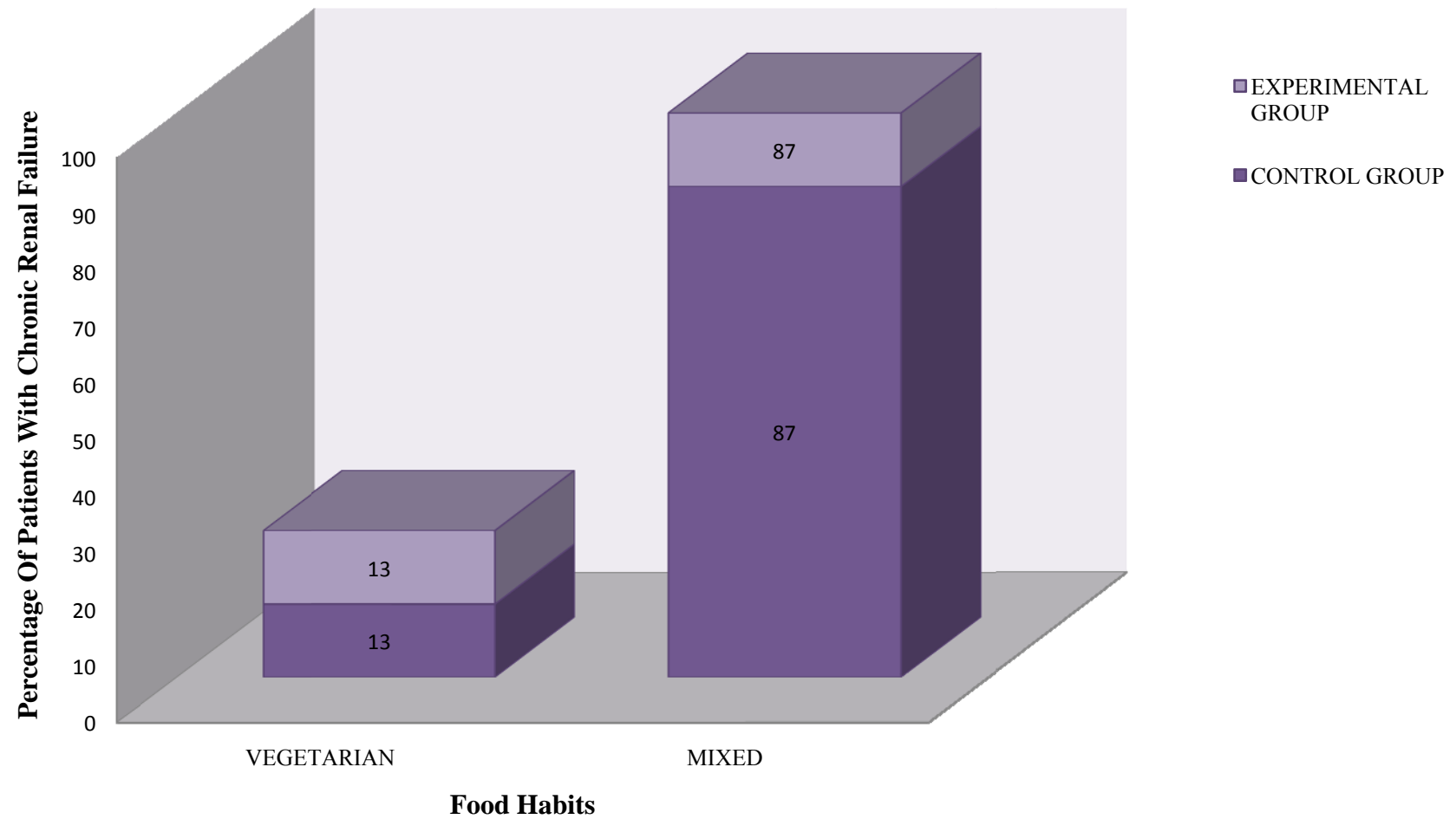
**Fig.4.2** Bar diagram shows the percentage distribution of patients according to their gender.



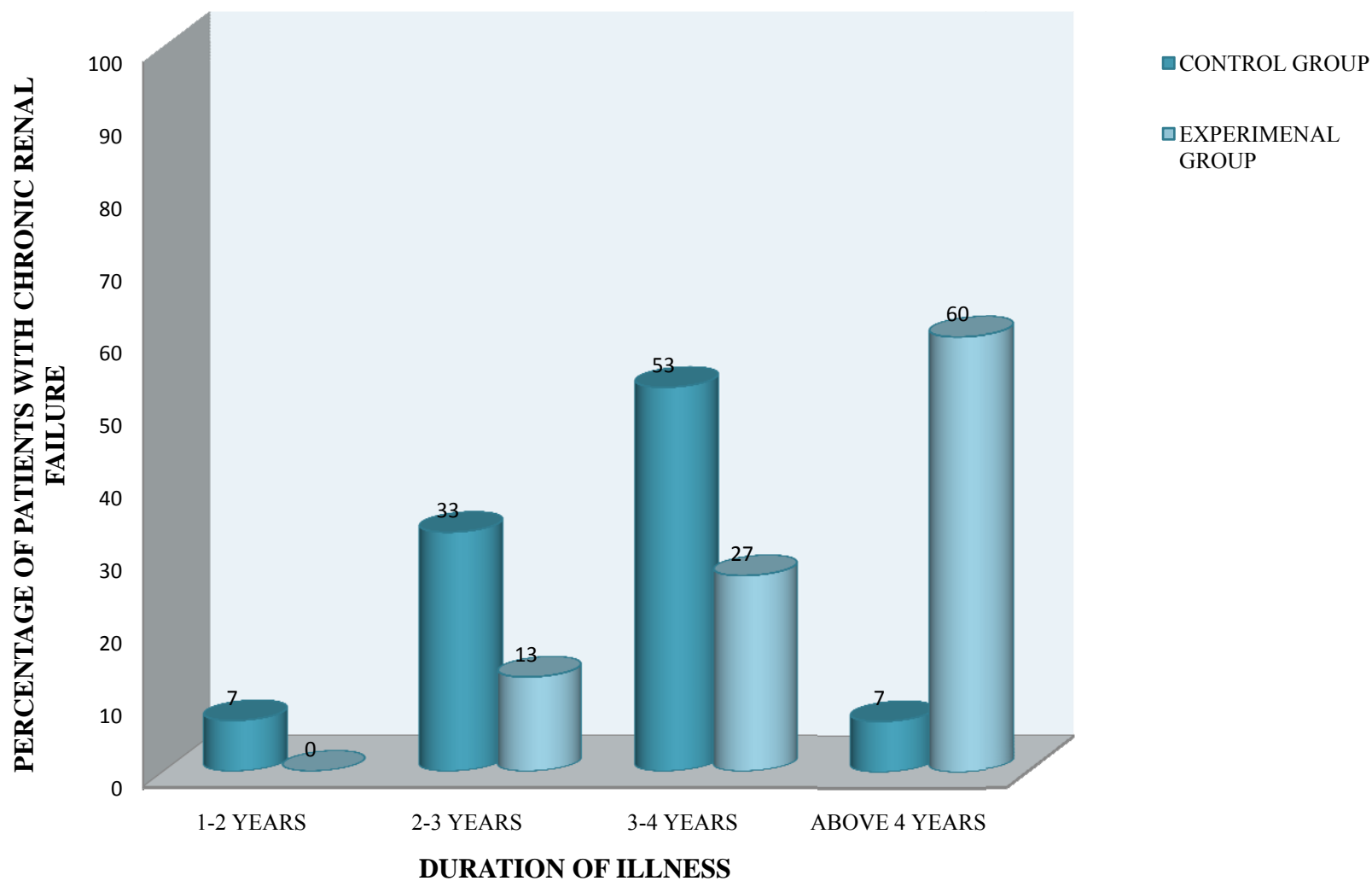
**Fig.4.3** Bar diagram shows the percentage distribution of patient with according to their educational status.



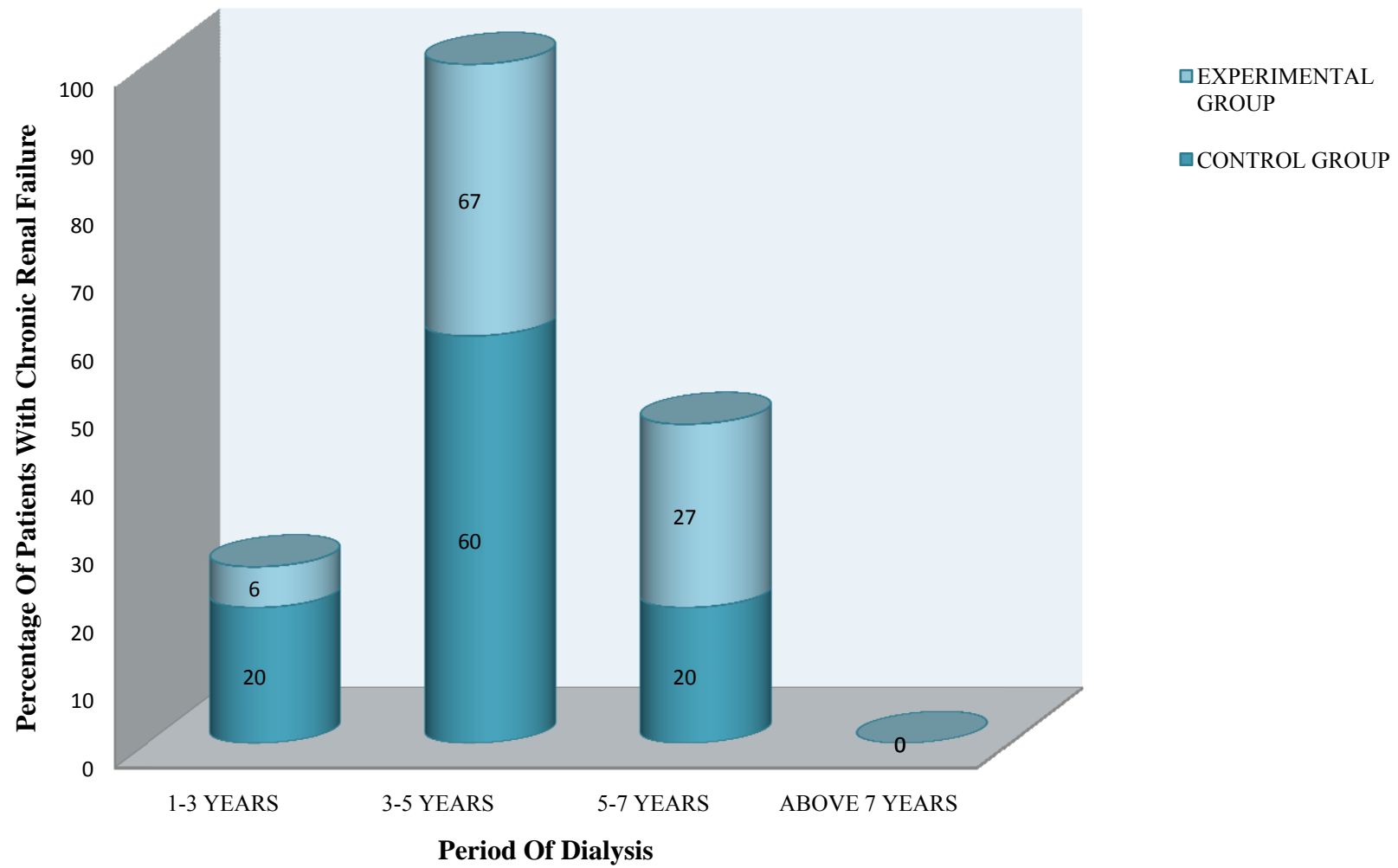
**Fig.4.4** Bar diagram shows the percentage distribution of patients according to their marital status.



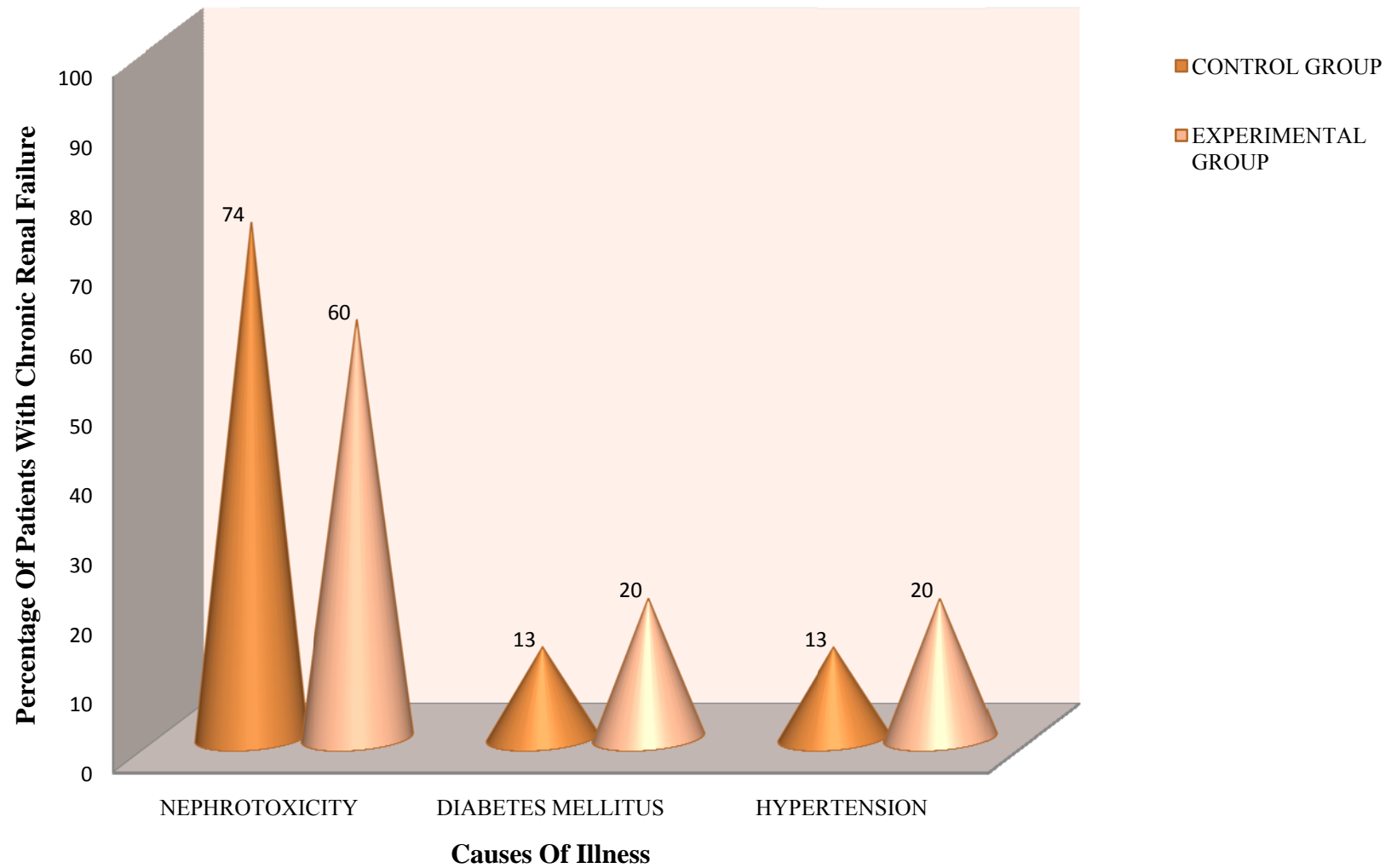
**Fig.4.5** Bar diagram shows the percentage distribution of patients according to their food habits.



**Fig.4.6** Cone diagram shows the percentage distribution of patients according to their duration of illness.



**Fig.4.7** Cone diagram shows the percentage distribution of patients according to their period of dialysis.



**Fig.4.8** Pyramid diagram shows the percentage distribution of patients according to their causes of illness



## SECTION-B

**ASSESS THE LEVEL OF RENAL FUNCTION AMONG CONTROL AND EXPERIMENTAL GROUP AMONG PATIENT WITH CHRONIC RENAL FAILURE BEFORE AND AFTER LEACHED POTATO.**

**Table 4.2 Frequency and percentage distribution of the control group pre and posttest scores of renal function among patients with chronic renal failure.**

(N<sub>2</sub> = 15)

Level of renal function	Control Group			
	Pretest scores		Posttest scores	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Highly impaired	15	100	14	93
Moderately impaired	0	0	1	7
Mildly impaired	0	0	0	0

Frequency and percentage distribution of control group pretest and posttest scores of renal function among patients with chronic renal failure depicts that, in pretest all (100%) patients with chronic renal failure had highly impaired level of renal function, whereas in posttest most (93%) of them had highly impaired level of renal function and 7% of them had moderately impaired level of renal function. . It seems that without intervention there is no obvious change in the renal function among patients with chronic renal failure.

**Table 4.3 Frequency and percentage distribution of the experimental group pre and posttest scores of renal function among patients with chronic renal failure**

(N<sub>1</sub>=15,)

<b>Level of renal function</b>	<b>Experimental Group</b>			
	<b>Pretest scores</b>		<b>Posttest scores</b>	
	<b>Frequency (N)</b>	<b>Percentage (%)</b>	<b>Frequency (N)</b>	<b>Percentage (%)</b>
Highly impaired	11	73	9	60
Moderately impaired	4	27	6	40
Mildly impaired	0	0	0	0

Frequency and percentage distribution of experimental group pretest and posttest scores of renal function among patients with chronic renal failure depicts that, in pretest 73% of them had highly impaired level of renal function and 27% of them had moderately impaired level of renal function, whereas in posttest majority (60%) of them had highly impaired level of renal function and 40% of them had moderately impaired level of renal function. It seems that with leached potato, there is no major change in renal function

**Table 4.4 Frequency and percentage distribution of posttest scores of renal function in control group and experimental group**

( $N_1 = 15$ ,  $N_2 = 15$ )

Level of renal function	Posttest scores			
	Control group		Experimental group	
	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)
Highly impaired	14	93	9	60
Moderately impaired	1	7	6	40
Mildly impaired	0	0	0	0

Frequency and percentage distribution of control and experimental group posttest scores of renal function among patients with chronic renal failure depicts that, In control group, 93% of them had highly impaired level of renal function and 7% of them had moderately impaired level of renal function, whereas in experimental group 60% of them had highly impaired level of renal function and 40% of them had moderately impaired level of renal function. It seems that leached potato on renal function among patients with chronic renal failure was effective.

## SECTION-C

### DETERMINE THE CHANGES IN RENAL FUNCTION AMONG PATIENTS WITH CHRONIC RENAL FAILURE IN CONTROL AND EXPERIMENTAL GROUP AFTER LEACHED POTATO.

The role of leached potato was tested by using paired 't' test and unpaired 't' test . Paired 't' test and unpaired 't' test was calculated to analyze the difference in pre and posttest scores of patients with chronic renal failure in the control and experimental groups and posttest scores of patients with chronic renal failure in both the groups respectively.

**Table-4.5 Paired 't' test value of pre and posttest scores of control group**

<b>Renal function parameters</b>	<b>Paired 't' value</b>	<b>Df</b>	<b>Table value</b>	<b>Level of significant (P)</b>
Urinary output in 24 hrs	0	14	2.145	P > 0.05 Not Significant
Systolic blood pressure	12.6	14	2.145	P < 0.05 Significant
Diastolic blood pressure	3.8	14	2.145	P < 0.05 Significant
Weight loss in kg	0	14	2.145	P > 0.05 Not Significant
Serum Potassium	2.3	14	2.145	P < 0.05 Significant
Serum creatinine	9.5	14	2.145	P < 0.05 Significant
Edema	1.75	14	2.145	P > 0.05 Not Significant
<b>Total</b>	<b>3.56</b>	<b>14</b>	<b>2.145</b>	<b>P &lt; 0.05 Significant</b>

Paired 't' test was calculated to analyze the effectiveness of leached potato between pre and posttest scores of control group on renal function. The paired 't' test value was 3.56 when compared to table value 2.145, it is high. It seems that there is significant relationship between leached potato and renal function among patients with chronic renal failure.

**Table-4.6 Paired ‘t’ test value of pre and posttest scores of experimental group**

<b>Renal function parameters</b>	<b>Paired ‘t’ value</b>	<b>Df</b>	<b>Table value</b>	<b>Level of significant (P)</b>
Urinary output in 24 hrs	1.14	14	2.145	P > 0.05 Not Significant
Systolic blood pressure	4.56	14	2.145	P < 0.05 Significant
Diastolic blood pressure	0.6	14	2.145	P > 0.05 Not Significant
Weight loss in kg	1.14	14	2.145	P > 0.05 Not Significant
Serum Potassium	2.85	14	2.145	P > 0.05 Significant
Serum creatinine	0.9	14	2.145	P > 0.05 Not Significant
Edema	2.9	14	2.145	P < 0.05 Significant
<b>Total</b>	<b>4.96</b>	<b>14</b>	<b>2.145</b>	<b>P &lt; 0.05 Significant</b>

Paired ‘t’ test was calculated to analyze the effectiveness of leached potato between pre and posttest scores of experimental group on renal function. The paired ‘t’ test value was 4.96 when compared to table value 2.145, it is high. It seems that there is significant relationship between leached potato and renal function among patients with chronic renal failure.

**Table-4.7 Area wise comparison of mean, SD, and mean percentage of pre and posttest scores of renal function in control group**

Renal function parameters	Maximum scores	Control group						Difference in mean %
		Pretest scores			Posttest scores			
		Mean	SD	Mean %	Mean	SD	Mean %	
Urinary output in 24 hrs	4	1.2	0.46	30	1.4	0.65	35	5
Systolic blood pressure	4	1.8	0.75	45	2.3	0.98	58	13
Diastolic blood pressure	4	2.7	0.53	68	2.8	0.37	70	2
Weight loss in Kg	4	1.2	0.46	30	1.4	0.65	35	5
Serum Potassium	4	2.9	0.26	73	3.2	0.71	80	7
Serum creatinine	4	1	0.0	25	1.1	0.37	28	3
Edema	4	2.9	0.71	73	3	0.84	75	2
Total	28	12.6	1.97	45	13.3	1.64	48	3

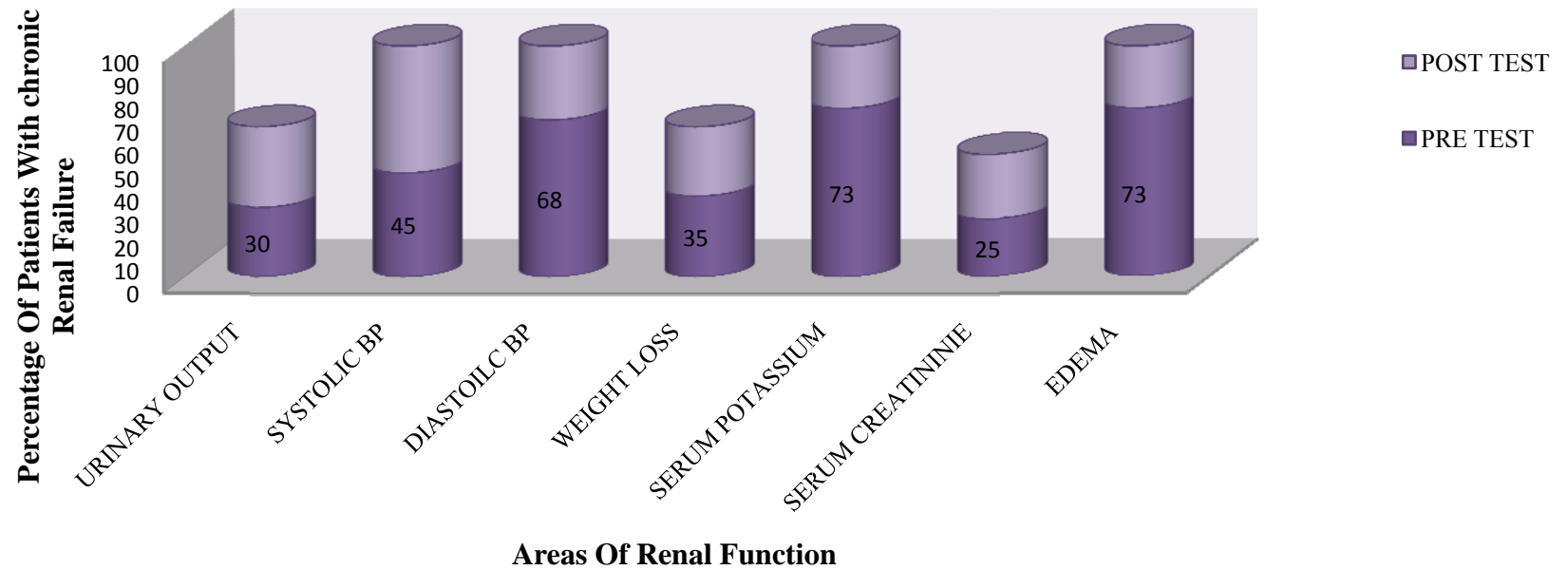
Comparison of mean, SD, mean percentage of control group pre and posttest scores reveals that, in pretest the highest mean score was (2.9±0.26),



which is 73% whereas mean score for posttest was  $(3.2 \pm 0.71)$ , which is 80% showing a difference of 7% on potassium.

In pretest the lowest mean score was  $(1.0 \pm 0.0)$ , which is 25% whereas mean score for posttest was  $(1.1 \pm 0.37)$ , which is 28% showing the maximum difference of 3% on serum creatinine.

Similarly the overall mean percentage of score for pretest was 45% whereas in posttest it was 48% revealing a difference of 3%. It depicts that the leached potato related to renal function was effective among patients with chronic renal failure. The findings are graphically represented in **Fig: 4.9**



**Fig: 4.9: Cone diagram showing the percentage distribution of control group pre and posttest scores of renal function among patients with chronic renal failure**

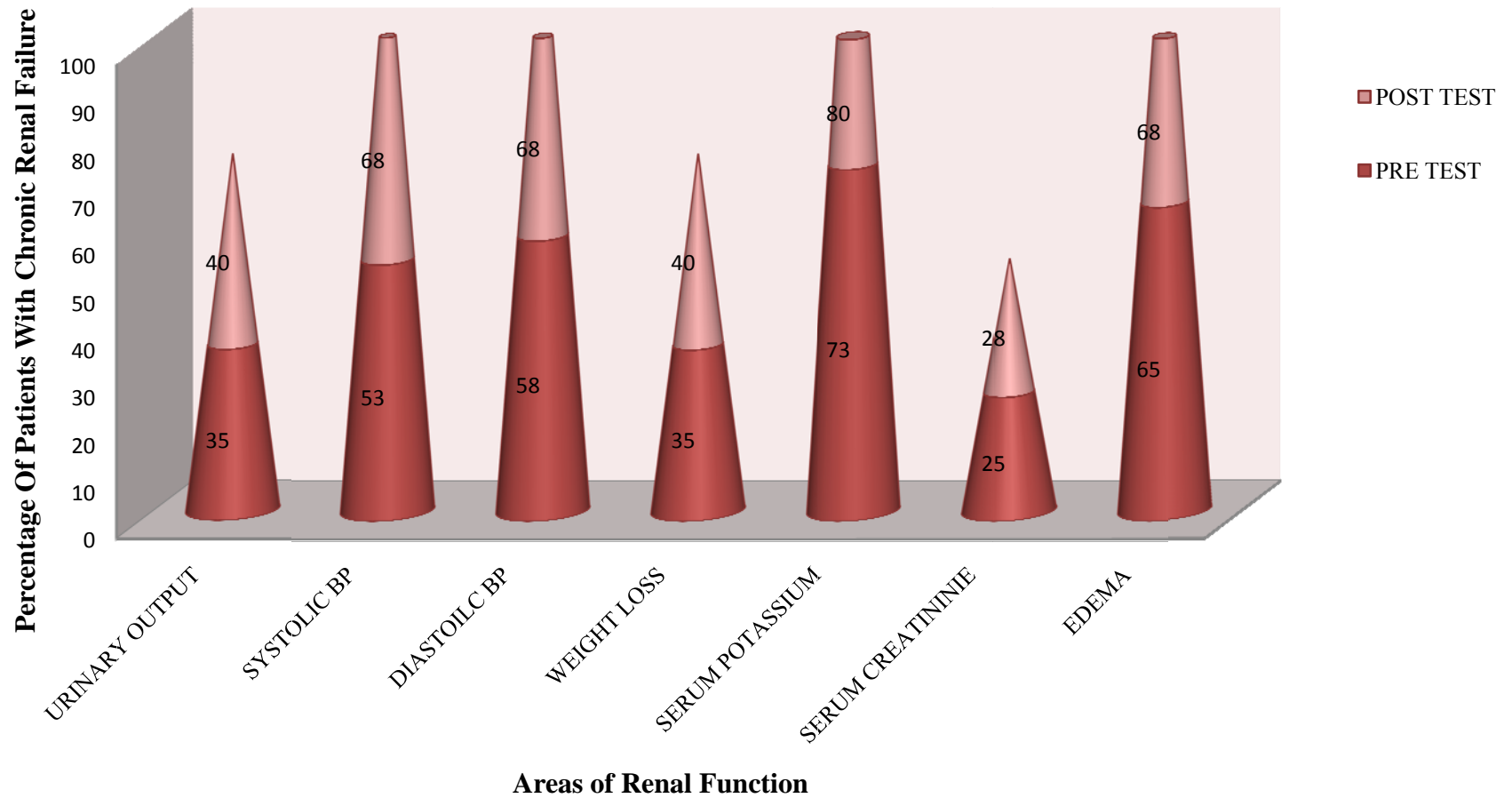
**Table-4.8 Area wise comparison of mean, SD, and mean percentage of pre and posttest scores of renal function in experimental group.**

Renal function parameters	Maximum scores	Experimental group						Difference in mean %
		Pretest scores			Posttest scores			
		Mean	SD	Mean %	Mean	SD	Mean %	
Urinary output in 24 hrs	4	1.4	0.71	35%	1.6	0.7	40%	5
Systolic blood pressure	4	2.1	0.80	53	2.7	0.5	68	15
Diastolic blood pressure	4	2.3	0.80	58	2.7	0.8	68	10
Weight loss in Kg	4	1.4	0.71	35	1.6	0.7	40	5
Serum Potassium	4	2.9	2.6	73	3.2	0.5	80	7
Serum creatinine	4	1	0	25	1.1	0.2	28	3
Edema	4	2.6	0.65	65	2.7	0.7	68	3
Total	28	12.4	1.48	44	13.8	1.09	59	5

Comparison of mean, SD, mean percentage of experimental group pre and posttest scores reveals that, in pretest the highest mean score was  $(2.9 \pm 2.6)$ , which is 73% whereas mean score for posttest was  $(3.2 \pm 0.5)$ , which is 80% showing 7% difference on potassium .

In pretest the lowest mean score was  $(1 \pm 0)$ , which is 25% whereas mean score for posttest was  $(1.1 \pm 0.2)$ , which is 28% showing a difference of 3% on the area of serum creatinine.

Similarly the overall mean percentage of score for pretest was 44% whereas in posttest it was 49% revealing a difference of 5%. It depicts that with intervention of leached potato on renal function was effective among patients with chronic renal failure. The findings are graphically represented in **Fig: 4.10**



**Fig: 4.10: Pyramid diagram showing the percentage distribution of experimental group pre and posttest scores of renal function among patients with chronic renal failure.**

**Table-4.9 Unpaired ‘t’ test value of control and experimental group pretest scores**

<b>Renal function parameters</b>	<b>Unpaired ‘t’ value</b>	<b>Df</b>	<b>Table value</b>	<b>Level of significance (P)</b>
Urinary output in 24 hrs	1.17	28	2.05	P > 0.05 Not Significant
Systolic blood pressure	0.3	28	2.05	P> 0.05 Not Significant
Diastolic blood pressure	1.9	28	2.05	P>0.05 Not Significant
Weight loss in kg	1.17	28	2.05	P > 0.05 Not Significant
Serum Potassium	0	28	2.05	P> 0.05 Not Significant
Serum creatinine	0	28	2.05	P> 0.05 Not Significant
Edema	1.8	28	2.05	P>0.05 Not Significant
<b>Total</b>	<b>0.4</b>	<b>28</b>	<b>2.05</b>	<b>P &gt;0.05 Not Significant</b>

Unpaired ‘t’ test was calculated to analyze the effectiveness between experimental and control groups pretest scores on renal function among patients with chronic renal failure. The Unpaired ‘t’ value was 0.4 when compared to table value 2.05 is high. It seems that there is no significant change in renal function among patients with chronic renal failure in control and experimental group before leached potato.

**Table-4.10 Unpaired ‘t’ test value of control and experimental group posttest scores**

<b>Renal function parameters</b>	<b>Unpaired ‘t’ value</b>	<b>Df</b>	<b>Table value</b>	<b>Level of significance (P)</b>
Urinary output in 24 hrs	0.6	28	2.05	P > 0.05 Not Significant
Systolic blood pressure	1.25	28	2.05	P> 0.05 Not Significant
Diastolic blood pressure	2	28	2.05	P>0.05 Not Significant
Weight loss in kg	0.5	28	2.05	P > 0.05 Not Significant
Serum Potassium	0.5	28	2.05	P> 0.05 Not Significant
Serum creatinine	1.6	28	2.05	P> 0.05 Not Significant
Edema	1.6	28	2.05	P> 0.05 Not Significant
<b>Total</b>	<b>0.2</b>	<b>28</b>	<b>2.05</b>	<b>P &gt; 0.05 Not Significant</b>

Unpaired ‘t’ test was calculated to analyze the effectiveness between experimental and control groups posttest scores on renal function among patients with chronic renal failure. The Unpaired ‘t’ value was 0.2 when compared to table value 2.05 is high. It seems that there is no significant change in renal function among patients with chronic renal failure in control and experimental group after leached potato.

**Table-4.11 Area wise comparison of mean, SD, mean percentage of posttest scores of renal function in control and experimental group**

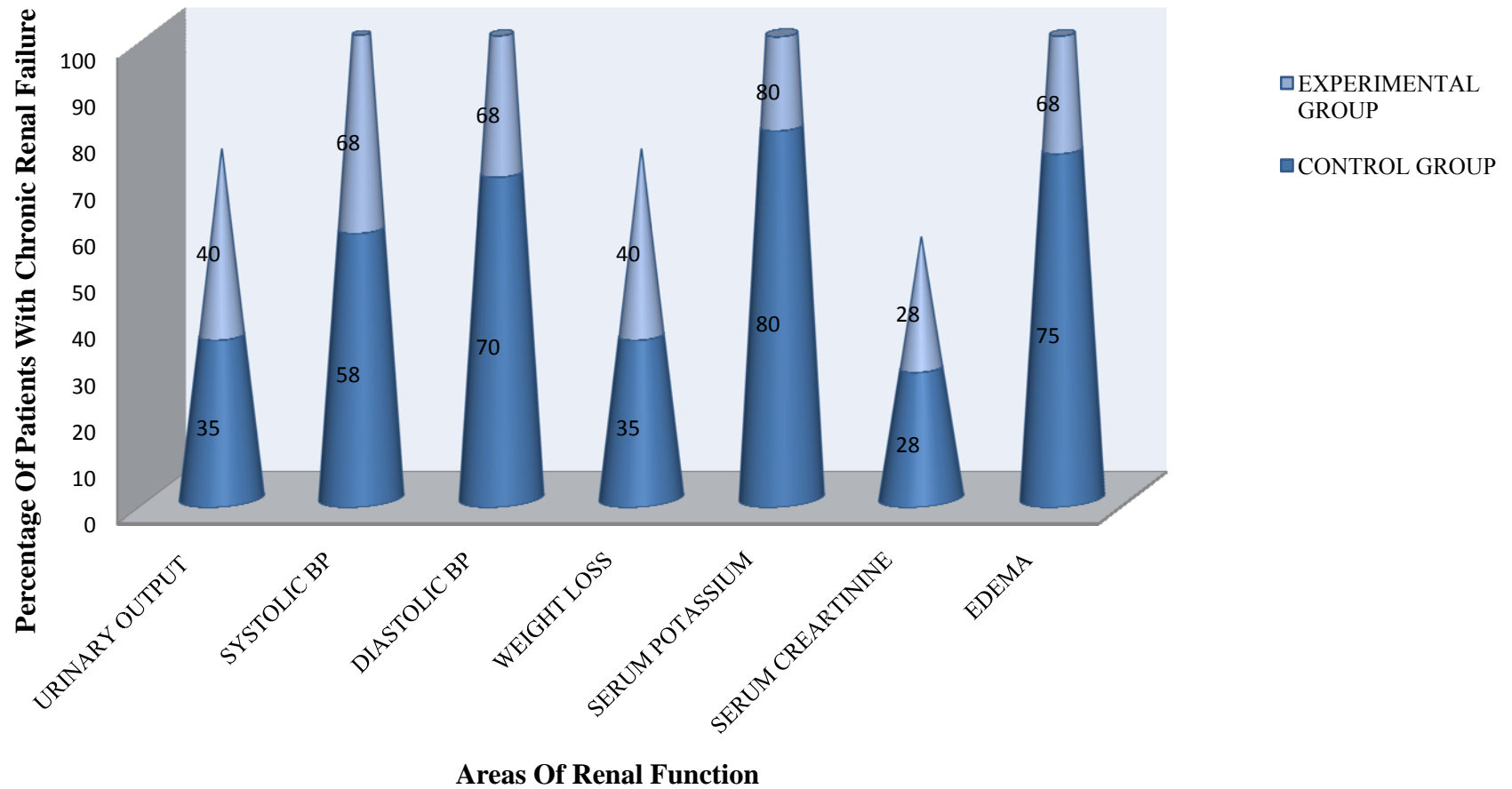
Renal function parameters	Maximum scores	Posttest scores						Difference in mean %
		Control group			Experimental group			
		Mean	SD	Mean %	Mean	SD	Mean %	
Urinary output in 24 hrs	4	1.4	0.65	35	1.6	0.7	40	5
Systolic blood pressure	4	2.3	0.98	58	2.7	0.5	68	10
Diastolic blood pressure	4	2.8	0.37	70	2.7	0.8	68	2
Weight loss in Kg	4	1.4	0.65	35	1.6	0.7	40	5
Serum Potassium	4	3.2	0.71	80	3.2	0.5	80	0
Serum creatinine	4	1.1	0.37	28	1.1	0.2	28	0
Edema	4	3	0.84	75	2.7	0.7	68	7
Total	28	13.3	1.64	48	13.8	1.09	58	10

Comparison of mean, SD, mean percentage of posttest scores of both control and experimental groups depicts that in control group the highest mean score was (3.2±0.71), which is 80% whereas in experimental group the mean score was (3.2±0.5), which is 80% on potassium level. It reveals 0.0% of mean difference.



In control group the lowest mean score was  $(1.1 \pm 0.2)$ , which is 28% whereas in experimental group the lowest mean score was  $(1.1 \pm 0.37)$ , which is 28% on the area of serum creatinine. It reveals the difference of 0.0%.

Similarly the overall mean percentage of score in control group was 48%, whereas in experimental group the mean percentage was 59% revealing a difference of 10%. It depicts that the leached potato on renal function was effective among patients with chronic renal failure. The findings are graphically represented in **Fig: 4.11**



**Fig: 4.11: Pyramid diagram showing the percentage distribution of control and experimental group posttest scores of renal function among patients with chronic renal failure.**

## SECTION-D

**FIND OUT THE ASSOCIATION BETWEEN POSTTEST SCORES OF RENAL FUNCTION AMONG CONTROL AND EXPERIMENTAL GROUP OF PATIENTS WITH CHRONIC RENAL FAILURE WITH THEIR DEMOGRAPHIC VARIABLES.**

Chi-square was calculated to analyze the association between posttest scores on renal function among control and experimental group of patients with chronic renal failure with their demographic variables.

**Table-4.12 Chi-square value of association between control group posttest scores with their demographic variables**

<b>Demographic variables</b>	<b>Df</b>	<b>Chi-square</b>	<b>Table Value</b>	<b>Level of significance</b>
Age in years	2	0.4	5.99	P> 0.05 Not Significant
Gender	1	3.3	3.84	P> 0.05 Not Significant
Education	3	0.6	7.84	P> 0.05 Not Significant
Marital status	1	2.1	3.84	P> 0.05 Not Significant
Food habits	1	0.5	3.84	P> 0.05 Not Significant
Duration of illness	2	1.5	5.99	P> 0.05 Not Significant
Period of dialysis	2	0.7	5.99	P> 0.05 Not Significant
Cause of illness	2	1.6	5.99	P> 0.05 Not Significant

Chi-square was calculated to find out the association between control group posttest scores of the patients with chronic renal failure with their demographic variables regarding leached potato on renal function. It reveals that there was no significant association between the posttest scores of control group when compared to age in years, gender, education, marital status, food habits, duration of illness, period of dialysis, and cause of illness, ( $P < 0.05$ ). Hence the differences observed in the mean scores values were only by chance and not true difference. It seems that leached potato was effective to all patients with chronic renal failure irrespective of their demographic variables.

**Table-4.13 Chi-square value of association between experimental group posttest scores with their demographic variables**

<b>Demographic variables</b>	<b>Df</b>	<b>Chi-square</b>	<b>Table Value</b>	<b>Level of significance</b>
Age in years	2	0.6	5.99	P> 0.05 Not significant
Gender	1	1	3.84	P > 0.05 Not significant
Education	3	1.04	7.81	P > 0.05 Not significant
Marital status	1	0.6	3.84	P > 0.05 Not significant
Food habits	1	1.1	3.84	P > 0.05 Not significant
Duration of illness	2	0.3	5.99	P > 0.05 Not significant
Period of dialysis	2	0.3	5.99	P > 0.05 Not significant
Cause of illness	2	0.94	5.99	P > 0.05 Not significant

Chi-square was calculated to find out the association between experimental group posttest scores of the patients with chronic renal failure with their demographic variables regarding leached potato on renal function. It reveals that there was no significant association between the posttest scores of experimental

group when compared to age in years, gender, education, marital status, food habits, duration of illness, period of dialysis, and cause of illness, ( $P > 0.05$ ). Hence the differences observed in the mean scores values were only by chance and not true difference. It seems that leached potato was effective to all patients with chronic renal failure irrespective of their demographic variables.

## SUMMARY

This chapter deals with analysis and interpretation of data collected to evaluate the effectiveness of leached potato on renal function. Findings revealed that mean posttest scores of patients with chronic renal failure in experimental group ( $13.8 \pm 1.09$ ), whereas in control group posttest score was ( $13.3 \pm 1.64$ ). It indicates that leached potato was effective among patients with chronic renal failure. The paired 't' test showed there is moderately significant relation between leached potato and renal function among patients with chronic renal failure, unpaired 't' test showed that there is no significant relation between leached potato and renal function and chi-square test showed no association between their demographic variables with experimental and control groups posttest scores.

## **CHAPTER – V**

### **DISCUSSION**

This chapter deals with the discussion which was based on the findings obtained from the statistical analysis and its relation to the objectives of the study, the conceptual frame work and the related literature.

This study was used to assess the role of leached potato on renal function among patients with chronic renal failure in Nallaswamy Kidney Centre, Erode. The following were the objectives of this study.

### **OBJECTIVES**

1. To assess the level of renal function among patients with chronic renal failure in experimental and control group before and after leached potato
2. To determine the changes in renal function among patients with chronic renal failure in experimental and control group after leached potato.
3. To find out the association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.

## **OBJECTIVES**

**1) To assess the level of renal function among patient with chronic renal failure patient in experimental and control group before and after leached potato.**

- **Frequency and percentage distribution of control group pretest and posttest scores of renal function among patients with chronic renal failure depicts that,**
  - In pretest majority (100%) of patients with chronic renal failure had highly impaired level of renal function
  - In posttest all (93%) of them had highly impaired level of renal function and 7% of them had moderately impaired level of renal function.
  - It seems that without intervention there is no obvious change in the renal function among patients with chronic renal failure.
- **Frequency and percentage distribution of experimental group pretest and posttest scores of renal function among patients with chronic renal failure depicts that,**



- In pretest 73% of them had highly impaired level of renal function and 27% of them had moderately impaired level of renal function
- In posttest majority (60%) of them had highly impaired level of renal function and 40% of them had moderately impaired level of renal function.
- It seems that there is no major change in renal function.
- **Frequency and percentage distribution of control and experimental group posttest scores of renal function among patients with chronic renal failure depicts that,**
  - In control group, 93% of them had highly impaired level of renal function and in experimental group 60% of them had highly impaired level of renal function.
  - In experimental group 40% of them had moderately impaired level of renal and in control group 7% of them had moderately impaired level of renal function
  - It seems that leached potato on renal function among patients with chronic renal failure was effective.

## **HYPOTHESIS**

**H<sub>1</sub>** : There is significant level of renal function among patients with chronic renal failure in experimental and control group before and after leached potato, so the hypothesis is accepted.

### **Objective 2**

**To determine the changes in renal function among patients with chronic renal failure in control and experimental group after leached potato.**

**Paired ‘t’ test, Unpaired ‘t’ test, area wise mean, SD, mean percentage value of pre and posttest scores of control and experimental group on renal function.**

#### **✓ In urinary output**

- Paired ‘t’ test value for control group was 0, ( $P > 0.05$ ) and experimental group was 1.14, ( $P > 0.05$ )
- Unpaired ‘t’ test value for pretest scores was, 1.17, ( $P > 0.05$ ) and posttest scores was 0.6, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $1.2 \pm 0.46$  which is 30% and experimental group was  $1.4 \pm 0.71$  which is 35%

- Posttest mean, SD score of control group was  $1.4 \pm 0.65$  which is 35% and experimental group was  $1.6 \pm 0.7$  which is 40%
- The mean difference of control and experimental group was 5%.
- Mean percentage of posttest in control group was 35% and experimental group was 40%
- Mean difference of posttest in control and experimental group was 5%

✓ **In systolic BP**

- Paired 't' test value for control group was 12.6, ( $P < 0.05$ ) and experimental group was 4.56, ( $P < 0.05$ )
- Unpaired 't' test value for pretest scores was 0.3, ( $P > 0.05$ ) and posttest scores was 1.25, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $1.8 \pm 0.75$  which is 45% and experimental group was  $2.1 \pm 0.80$  which is 53%
- Posttest mean, SD score of control group was  $2.3 \pm 0.98$  which is 58% and experimental group was  $2.7 \pm 0.5$  which is 68%
- The mean difference in control group was 13% and in experimental group was 15%

- Mean percentage of posttest in control group was 58% and experimental group was 60%
- Mean difference of posttest in control and experimental group was 10%

✓ **In diastolic BP**

- Paired 't' test value for control group was 3.8, ( $P < 0.05$ ) and experimental group was 0.6, ( $P > 0.05$ )
- Unpaired 't' test value for pretest scores was 1.9, ( $P > 0.05$ ) and posttest scores was 2, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $2.7 \pm 0.53$  which is 68% and experimental group was  $2.3 \pm 0.80$  which is 58%
- Posttest mean, SD score of control group was  $2.8 \pm 0.37$  which is 70% and experimental group was ( $2.7 \pm 0.80$ ) which is 68%
- The mean difference in control group was 2% and experimental group was 10%
- Mean percentage of posttest in control group was 70% and experimental group was 68%
- Mean difference of posttest in control and experimental group was 2%

✓ **In weight loss**

- Paired 't' test value for control group was 0, ( $P > 0.05$ ) and experimental group was 1.14, ( $P > 0.05$ )
- Unpaired 't' test value for pretest scores was, 1.17, ( $P > 0.05$ ) and posttest scores was 0.6, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $1.2 \pm 0.46$  which is 30% and experimental group was  $1.4 \pm 0.71$  which is 35%
- Posttest mean, SD score of control group was  $1.4 \pm 0.65$  which is 35% and experimental group was  $1.6 \pm 0.7$  which is 40%
- The mean difference in control group was 5% and in experimental group was 5%
- Mean percentage of posttest in control group was 35% and experimental group was 40%
- Mean difference of posttest in control and experimental group was 5%

✓ **In serum potassium**

- Paired 't' test value for control group was 2.3, ( $P < 0.05$ ) and experimental group was 2.85, ( $P < 0.05$ )

- Unpaired 't' test value for pretest scores was,0, ( $P > 0.05$ ) and posttest scores was 0.5, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $2.9 \pm 0.26$  which is 73% and experimental group was  $2.9 \pm 2.6$  which is 73%
- Posttest mean, SD score of control group was  $3.2 \pm 0.71$  which is 80% and experimental group was  $3.2 \pm 0.5$  which is 80%
- The mean difference in control group was 7% and experimental group was 7%
- Mean percentage of posttest control group was 80% and experimental group was 80%
- Mean difference of posttest control and experimental group was 0%

✓ **In serum creatinine**

- Paired 't' test value for control group was 9.5, ( $P < 0.05$ ) and experimental group was 0.9, ( $P < 0.05$ )
- Unpaired 't' test value for pretest scores was,0, ( $P > 0.05$ ) and posttest scores was 1.6, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $1 \pm 0.0$  which is 25% and experimental group was  $1 \pm 0.0$  which is 25%

- Posttest mean, SD score of control group was  $1.1 \pm 0.37$  which is 28% and experimental group was  $1.1 \pm 0.2$  which is 28%
- The mean difference in control group was 3% and in experimental group was 3%
- Mean percentage of posttest in control group was 28% and in experimental group was 28%
- Mean difference of posttest in control and experimental group was 0%

✓ **In edema**

- Paired 't' test value for control group was 1.75, ( $P > 0.05$ ) and experimental group was 2.9, ( $P < 0.05$ )
- Unpaired 't' test value for pretest scores was 1.8, ( $P > 0.05$ ) and posttest scores was 1.6, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $2.9 \pm 0.71$  which is 73% and experimental group was  $2.6 \pm 0.65$  which is 65%
- Posttest mean, SD score of control group was  $3 \pm 0.84$  which is 75% and experimental group was  $2.7 \pm 0.7$  which is 68%
- The mean difference in control group was 2% and in experimental group was 3%

- Mean percentage of posttest in control group was 75% and experimental group was 68%
- Mean difference of posttest in control and experimental group was 7%

✓ **In total**

- Paired 't' test value for control group was 3.56, ( $P < 0.05$ ) and experimental group was 4.96, ( $P < 0.05$ )
- Unpaired 't' test value for pretest scores was 0.4, ( $P > 0.05$ ) and posttest scores was 0.2, ( $P > 0.05$ )
- Pretest mean, SD score of control group was  $12.6 \pm 1.96$  which is 45% and group was  $12.4 \pm 1.48$  which is 44%
- Posttest mean, SD score of control group was  $13.3 \pm 1.64$  which is 48% and experimental group was  $13.8 \pm 1.09$  which is 59%
- The mean difference in control group was 3% and experimental group was 5%
- Mean percentage of posttest in control group was 48% and experimental group was 59%
- Mean difference of posttest in control and experimental group was 11%



It seems that there is no change in renal function among patients with chronic renal failure in control and experimental group after leached potato at the same time, it did not create any adverse effect.

### **Hypothesis 2 :**

There is compromised level of renal function among patients with chronic renal failure patients in experimental and control group before and after leached potato. So the hypothesis is accepted.

**Objective 3: III. To find out the association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.**

1. Chi-square was calculated to find out the association between the posttest scores of experimental group of patients with chronic renal failure with their demographic variables (age in years, gender, education, marital status, food habits, duration of illness, period of dialysis, and cause of illness). ( $P > 0.05$ ). There is no significant association between posttest scores of experimental group with their demographic variables, the findings were only by chance not the true difference.

2. Chi-square was calculated to find out the association between posttest scores of experimental group of patients with chronic renal failure with their demographic variables (age in years, gender, education, marital status, food habits, duration of illness, period of dialysis, and cause of illness). ( $P > 0.05$ ). There is no

significant association between posttest scores of renal function among patients with chronic renal failure with their demographic variables, the findings were only by chance not the true difference.

**Hypothesis 3 :**

There is no significant association between posttest scores of renal function among experimental and control group of patients with chronic renal failure with their demographic variables, so the hypothesis is rejected.

## **CHAPTER - VI**

### **SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS**

This chapter deals with the summary of the study, its findings, conclusion and the implications for nursing administration, nursing practice, nursing education and nursing research. This study has been started with a few limitations and ends with suggestions and recommendations for research in future.

#### **SUMMARY**

The primary aim of the study was to assess the role of leached potato on renal function among patients with chronic renal failure in Nallaswamy Kidney Centre, Erode.

**The objectives of the study were,**

1. To assess the level of renal function among patients with chronic renal failure in experimental and control group before and after leached potato
2. To determine the changes in renal function among patients with chronic renal failure in control and experimental group after leached potato.

3. To find out the association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.

## **HYPOTHESES**

Researcher formulated and tested the following research by hypothesis

- H<sub>1</sub>** : There is significant level of renal function among patients with chronic renal failure in experimental and control group before and after leached potato.
- H<sub>2</sub>** : There is compromised level of renal function among patients with chronic renal failure patients in experimental and control group before and after leached potato
- H<sub>3</sub>** : There is significant association between posttest scores of renal function among patients with chronic renal failure in experimental and control group with their demographic variables.

The review of literature on related studies helped the investigator to design the methodology, conceptual framework and find out the tool. The literature review for the present study was presented under the following heading.

- Studies related to renal function
- Studies related to leached potato
- Studies related to dietary management other than leached potato among patients in chronic renal failure.
- Studies related to leached potato on renal function among patients with chronic renal failure.

The investigator developed **Orlando's Nursing Process Theory (1990)**. The research design adopted for the study was quasi-experimental study. Setting chosen to study was at Nallaswamy Kidney Centre, Erode. In this study the samples were patients with chronic renal failure. The sample size was 30 (experimental group 15 and control group 15). In this purposive sampling technique was used. Renal function parameter assessment scale was used to assess the level of renal function among patients with chronic renal failure.

The reliability of the assessment tool was tested by implementing the tool on patients with chronic renal failure who are outpatients in Government Head Quarters, Erode, which is other than the sample area. Split Half method (Spearman Brown man formula) was used to test the reliability of the tool and the tool was found to be reliable. ( $r^1 = 0.75$ ).

The main study was conducted in Nallaswamy Kidney Centre, Erode. The samples were selected by using purposive sampling method among those who

fulfill the sampling criteria. Data were gathered through Renal Function Parameter Assessment Scale on renal function. The data gathered are analyzed by descriptive and inferential statistical method and interpretation is made on the basis of the objectives of the study.

### **Major Findings of the study**

The major findings of the study are presented under the following headings;

1. Findings related to description of patients with chronic renal failure according to their demographic variables.
2. Findings related to level of renal function among patients with chronic renal failure in control and experimental group before and after leached potato
3. Findings related to level of renal function among patients with chronic renal failure in control and experimental group after leached potato.
4. Findings related to effectiveness of leached potato on level of renal function among patients with chronic renal failure.
5. Findings related to association of posttest scores of level of renal function among patients with chronic renal failure with their selected demographic variables.

**I. Findings related to description of patients with chronic renal failure according to their demographic variables.**

**In control group,**

- ✓ Most (47%) of the patients with chronic renal failure were in the age group of both 20-40 years and 40-60 years.
- ✓ Majority (73%) of the patients with chronic renal failure were males.
- ✓ 47% of the patients with chronic renal failure were degree holders..
- ✓ Most (87%) of the patients with chronic renal failure were married.
- ✓ Majority (87%) of the patients with chronic renal failure were both vegetarian and non-vegetarian as their food habits.
- ✓ Most (53%) of the patients with chronic renal failure has illness for about 2-3 years.
- ✓ Majority 60% of the patients with chronic renal failure were undergoing dialysis for about 3-5 years.
- ✓ Most (73%) of the patients with chronic renal failure had Nephrotoxicity as their cause of illness.

**In experimental group,**

- ✓ Most (53%) of the patients with chronic renal failure were in the age group of 40-60 years.
- ✓ Majority (60%) of the patients with chronic renal failure were males..
- ✓ 68% of the patients with chronic renal failure were degree holders.

- ✓ Most (73%) of the patients with chronic renal failure were married.
- ✓ 87% of the patients with chronic renal failure had mixed food habits.
- ✓ 60% of the patients with chronic renal failure had illness for about above 4 years.
- ✓ 67% of the patients with chronic renal failure were undergoing dialysis for about 3-5 years.
- ✓ 60% of the patients had chronic renal failure due to Nephrotoxicity.

## **II. Findings related to level of renal function among patients with chronic renal failure in control and experimental group before and after leached potato.**

- In control group,
  - In pretest majority (100%) of the patients with chronic renal failure had highly impaired level of renal function
  - In posttest all (93%) of the patients with chronic renal failure had highly impaired level of renal function and 7% of the patients with chronic renal failure had moderately impaired level of renal function.
- In experimental group,
  - In pretest majority (73%) of the patients with chronic renal failure had highly impaired level of renal function (27%) of the patients



with chronic renal failure had moderately impaired level of renal function.

- In posttest (60%) of the patients with chronic renal failure had highly impaired level of renal function and (40%) of the patients with chronic renal failure had moderately impaired level of renal function respectively.

### **III. Findings related to level of renal function among patients with chronic renal failure in control and experimental group after leached potato.**

- In Control group 93% of them had highly impaired level of renal function and in experimental group 60% of them had highly impaired level of renal function.
- In control group 7% of them had moderately impaired level of renal function and in experimental group, 40% of them had moderately impaired level of renal function.

### **VI. Findings related to changes in renal function among patients with chronic renal failure in control and experimental group after leached potato.**

- Paired 't' test value for control group was 3.56, ( $P < 0.05$ )
- Paired 't' test value for experimental group was, 4.96 ( $P < 0.05$ )
- Unpaired 't' test value for pretest scores was, 0.4 ( $P > 0.05$ )

- Unpaired 't' test value for posttest scores was, 0.2 ( $P > 0.05$ )
- The overall mean score for pretest in control group was  $12.6 \pm 1.97$  , which is 45%
- The overall mean score for posttest in control group was  $13.3 \pm 1.64$ , which is 48%
- The overall mean difference of control group was 3%
- The overall mean score for pretest in experimental group was  $12.4 \pm 1.48$ , which is 44%
- The overall mean score for posttest in experimental group was  $13.8 \pm 1.09$ , which is 59%
- The overall mean difference of experimental group was 5%
- The overall mean percentage of control group was 48%
- The overall mean percentage of experimental group was 59%
- The overall mean difference of posttest in control and experimental group was 11%

**V. Findings related to association of posttest scores of level of renal function among patients with chronic renal failure with their selected demographic variables.**

**In control group,**

- ✕ Chi-square value for age in years was 0.4, ( $P > 0.05$ )
- ✕ Chi-square value for gender was 3.3, ( $P > 0.05$ )
- ✕ Chi-square value for educational status was 0.6, ( $P > 0.05$ )
- ✕ Chi-square value for marital status was 2.1, ( $P > 0.05$ )
- ✕ Chi-square value for food habits was 0.5, ( $P > 0.05$ )
- ✕ Chi-square value for duration of illness was 1.5, ( $P > 0.05$ )
- ✕ Chi-square value for period of dialysis was 0.7, ( $P > 0.05$ )
- ✕ Chi-square value for causes of illness was 1.6, ( $P > 0.05$ )

**In experimental group,**

- ✕ Chi-square value for age in years was 0.6, ( $P > 0.05$ )
- ✕ Chi-square value for gender was 1, ( $P > 0.05$ )
- ✕ Chi-square value for educational status was 1.04, ( $P > 0.05$ )
- ✕ Chi-square value for marital status was 0.6, ( $P > 0.05$ )

- ✕ Chi-square value for food habits was 1.1, ( $P > 0.05$ )
- ✕ Chi-square value for duration of illness was 0.3, ( $P > 0.05$ )
- ✕ Chi-square value for period of dialysis was 0.3, ( $P > 0.05$ )
- ✕ Chi-square value for causes of illness was 0.94, ( $P > 0.05$ )

## CONCLUSION

From the findings of the study it can be concluded that,

- The highest percentage of patient with chronic renal function was in the age group of 20-40 years.
- Most of them were males
- Most of them were degree holders
- Most of them were married
- Most of them had mixed food habits
- Most of them had above 4 years of illness
- Most of them had dialysis for about 3-5 years
- Most of them had illness due to Nephrotoxicity.
- Obvious change in renal function is not observed.

- Compromised renal function was found on control and experimental group of patients with chronic renal failure before and after leached potato.
- No significant association was observed between control and experimental groups posttest scores of patients with chronic renal function with their demographic variables.

## **NURSING IMPLICATIONS**

### **Nursing Services**

1. The nursing personnel working in hospital can reinforce the health benefits of leached potato.
2. The nursing students can provide health education regarding leaching potato.
3. Process of leaching potato can be included in the dietary regimen for patients with chronic renal failure.
4. The nursing personnel

### **Nursing Education**

1. Nursing educator should educate the nursing professionals about the leaching process of potato.
2. Nurse educator must explain patients with chronic renal failure, the importance of leaching in respect to their health status.

3. The researcher educates the patients with chronic renal failure to add leached potato in their regular diet to maintain the renal function.

### **Nursing Research**

This study may be issued for further references. Further large scale study can be done as replication to standardize the leached potato on renal function.

### **Nursing administration**

1. Nurse administer can conduct in-service program regarding leaching process in various health sectors or agencies.
2. Nurse educator can issue brochures regarding leaching process in clinics and hospitals.
3. Nurse administer can support the nurses for conducting research on leaching fruits and vegetables.

### **RECOMMENDATIONS**

Based on the findings of the study the following recommendations have been made for the study.

- A large scale study can be carried out to generalize the findings.
- A similar study can be compared between each stages of chronic renal failure.

- A similar study can be done with other vegetables like cabbage, tomatoes, pumpkin, spinach, sweet corn, etc.,
- A similar study can be done with fruits like lime, orange, kiwi, banana, apple etc.,
- A similar study can be compared with fruits and vegetables
- A similar study can be conducted for 6 months or 1 year period of time.

## **SUMMARY**

This chapter has dealt with the summary of the study, major findings, conclusions, implications of the study in nursing field and recommendations for future

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## **APPENDIX-I**

### **LETTERS SEEKING PERMISSION TO CONDUCT STUDY**

**From**

Ms. Susan Olivial. A.

M.Sc. Nursing II Year, Dhanvantri college of Nursing.

Ganapathypuram, No.1, Ranganoor Road,

Muniyapan Kovil, Pallakkapalayam (po),

Sankagiri West, Namakkal (Dist).

**To.**

The principal,

Dhanvantri College of nursing,

Namakkal (Dist).

**Respected madam**

**Sub:** permission to conduct study in Nallaswamy Kidney Centre, Erode.

I Ms.Susan Olivial.A, II Year M.Sc.(Nursing) student of Dhanvantri College of Nursing, Pallakkapalayam as a partial fulfillment of Master of Science in Nursing. I have undertaken the following research study for my dissertation which has to be submitted to the DR.M.G.R Medical University, Chennai during december2011.

The Statement of the problem chosen for my study is **“Role of leached potato on renal function among patient with chronic renal failure, at Nallaswamy kidney centre, Erode.”**

I request you to permit me for conducting the study. Kindly do the needful.

Thanking you

Date: 22. 07. 2011

yours faithfully,

Place: Pallakkapalayam

(SUSAN OLIVIAL.A)

## **APPENDIX-II**

### **LETTER GRANTING PERMISSION TO CONDUCT STUDY**

**From**

Ms.Susan Olivial.A.

M.Sc. Nursing II Year, Dhanvantri college of Nursing.

Ganapathypuram, No.1, Ranganoor Road,

Muniyapan Kovil, Pallakkapalayam (po),

Sankagiri West, Namakkal (Dist).

**To.**

Through.

The principal,

Dhanvantri College of nursing,

Namakkal (Dist).

**Respected madam**

**Sub:** permission to conduct study in Nallaswamy Kidney Centre, Erode.

Ms.Susan Olivial.A, II Year M.Sc.(Nursing) student of Dhanvantri college of nursing, Pallakkapalayam as a partial fulfillment of master of science in nursing, have undertaken the following research study for my dissertation which has to be submitted to the DR.M.G.R Medical University, Chennai during december2011.

The Statement of the problem chosen for my study is **“Role of leached potato on renal function among patient with chronic renal failure, at Nallaswamy kidney centre, Erode.”**

She is in need of your help and co-operation to conduct this research study among patients with chronic renal failure in your esteemed hospital.

I request your kind office to permit me to collect the data from your hospital and allow me to utilize the needed facilities.

I assure you that my study will not in any way affect the routine work of the hospital nor would it harm study patients subjected for emotional freedom technique. Kindly do the needful

Thanking you

Date: 22. 07. 2011

Yours faithfully,

Place: Pallakkapalayam

### APPENDIX-III

#### LETTER SEEKING EXPERT OPINION ON CONTENT VALIDITY

From

Ms. Susan Olivial. A  
II year M.Sc (Nursing),  
Dhanvantri College of Nursing,  
Ganapathypuram, No: 1, Ranganoor road,  
Muniyappan Kovil, Pallakkapalayam, (PO), Namakkal (D.T).

To

Through  
The Principal  
Dhanvantri College of Nursing,  
Ganapathypuram, No: 1, Ranganoor road,  
Muniyappan Kovil, Pallakkapalayam, (PO), Namakkal (D.T).

Respected Sir/ Madam

Sub: Request for Validation of the Tool

I, Ms. Susan Olivial. A, II year M.Sc Nursing student of Dhanvantri College of Nursing, Pallakkapalayam as a partial fulfillment of Master of Science in Nursing, I have undertaken following research for my dissertation, which has to be submitted to the Tamilnadu Dr.M.G.R. Medical University, Chennai by December 2011.

The statement of problem chosen for my study is "**Role of leached potato on among patients with chronic renal failure at Nallaswamy kidney centre, Erode**".

To achieve the objectives of the dissertation, I have prepared the following tools:

1. Demographic data
2. Renal parameter assessment scale

With regard to this, I kindly request you to go through the tool validate it render your valuable suggestions. Thanking You

**Enclosures**

**Chapter 1&3 with tool**

Yours faithfully

(SUSAN OLIVIAL.A)



**APPENDIX –III**  
**POTASSIUM ANALYSIS CERTIFICATE**

**APPENDIX –IV**  
**CONTENT VALIDITY CERTIFICATE**

I hereby certify that I have validated the tool of Ms.Susan Olivial. A II year M.Sc. Nursing student of Dhanvantri College of Nursing, Erode, who is undertaking the dissertation work on **“Role of leached potato on renal function among patients with chronic renal failure at Nallaswamy Kidney Centre, Erode”**.

Place:

Signature of the Expert:

Date:

Name and Designation:

**APPENDIX-V**  
**DATA COLLECTION TOOL**  
**SECTION-A**  
**DEMOGRAPHIC VARIABLE**

**1. Age in years**

- a) 20-40
- b) 41-60
- c) Above 60

**2. Gender**

- a) Male
- b) Female

**3. Educational status**

- a) No formal education
- b) Primary
- c) High school
- d) Degree

**4. Marital status**

- a) Unmarried
- b) Married
- c) Widow(or) er

**5. Food habit**

- a) Vegetarian
- b) Non-vegetarian
- c) Mixed.

**6. Duration of illness (in years)**

- a) 1-2
- b) 2-3
- c) 3-4
- d) Above 4

**7. Period of dialysis (in years)**

- a) 1-3
- b) 3-5
- c) 5-7
- d) Above 7

**8. Causes of illness**

- a) Nephrotoxicity
- b) Drug toxicity
- c) Diabetes mellitus
- d) Hypertension
- e) others

## **SECTION B:**

This consists of renal function parameter assessment scale. It consists of seven parameters like urinary output in 24 hours, systolic BP, diastolic BP, weight loss, potassium, creatinine, Edema.

### **RENAL FUNCTION PARAMETER ASSESSMENT SCALE.**

PARAMETER	SCORES			
	1	2	3	4
URINARY OUTPUT IN 24 HRS	BELOW 300	301-500	501-700	ABOVE 700
SYSTOLIC BP	>180	160-179	140-159	<140
DIASTOLIC BP	>110	110-101	100-109	<90
WEIGHT LOSS	<2	2-3.9	4-5.9	>6
POATSSSIUM	>11	11-9	8.9-6.9	>5
CREATININE	>7	7-6.6	6.5-6.1	>6
EDEMA	+4	+3	+2	+1

## SCORING PROCEDURE

Based on the percentage of scores the level of renal function was graded in 3 categories. They are “**Highly impaired**”, “**Moderately impaired**” and “**Mildly impaired**”.

Level of renal function	Actual Score	Percentage (%)
Highly impaired	7 – 14	25 - 50%
Moderately impaired	15 – 21	51 - 75%
Mildly impaired	22 – 28	76 - 100 %

## **APPENDIX – VI**

### **BLUE PRINT DESCRIPTION ON LEACHING POTATO.**

#### **DEFINITION**

Leaching is a process of soaking and boiling vegetables whereby the potassium content from the respective vegetable is lost, which can be used for patients with reduced renal function.

#### **STEPS IN LEACHING**

Step 1: Wash 100gm of potato in the tap water

Step 2: Chop the potato into small pieces

Step 3: Soak the chopped potato in tap water for about one hour.

Step 4: Drain the water

Step 5: Boil the chopped potato in fresh water for 10 minutes.

Step 6: Drain the water

Step 7: Again re-boil the chopped potato in fresh water for 10 minutes.

Step 8: Drain the water.

Step 9: Repeat step 7 and step 8.

Step 10: Now the leached potato is used to prepare the dish.

## **WHEN IS IT TO BE TAKEN**

This leached potato is advised to take for six days in a week.

## **ADVANTAGES**

- It can be used for patients with hyperkalemia
- It can be used for patients with chronic renal failure
- This prevents muscle cramps.
- This also prevents cardiac death due to hyperkalemia.



## **APPENDIX-VII**

### **LIST OF EXPERTS**

**1. Mrs. VIJAYARANI PRINCE, Ph.D**

Principal,  
Bishop's college of nursing, C.S.I Compound,  
Dharapuram-638656, Tripur district.

**2. Mrs. LAKSHMI PRABHA, M.Sc (N)**

Asso. Professor  
Vinayaka Mission College of Nursing, Salem.

**3. Mrs. SUMATHI. M, M.Sc (N),**

Asso. Professor,  
Vinayaka Mission College of Nursing, Salem.

**4. Dr. SUDHAKAR, MBBS, M.Nephro,**

Lotus hospital, Erode.

**5. Mrs. POONKUZHALIL, (DIETICIAN),**

**6. Mr. DHANPAL,**

Statistician,  
Dhanvantri College of Nursing, Pallakapalayam,  
Namakkal.

## APPENDIX-VIII

### PHOTOGRAPHS



**Researcher showing the video demonstration on leaching potato to the care givers.**



**Researcher showing the video demonstration on leaching potato to the patient.**